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WAR BLINDNESS AT ST. DUNSTAN'S



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OXFORD MEDICAL PUBLICATIONS

WAR BLINDNESS

AT

ST. DUNSTAN'S

BY

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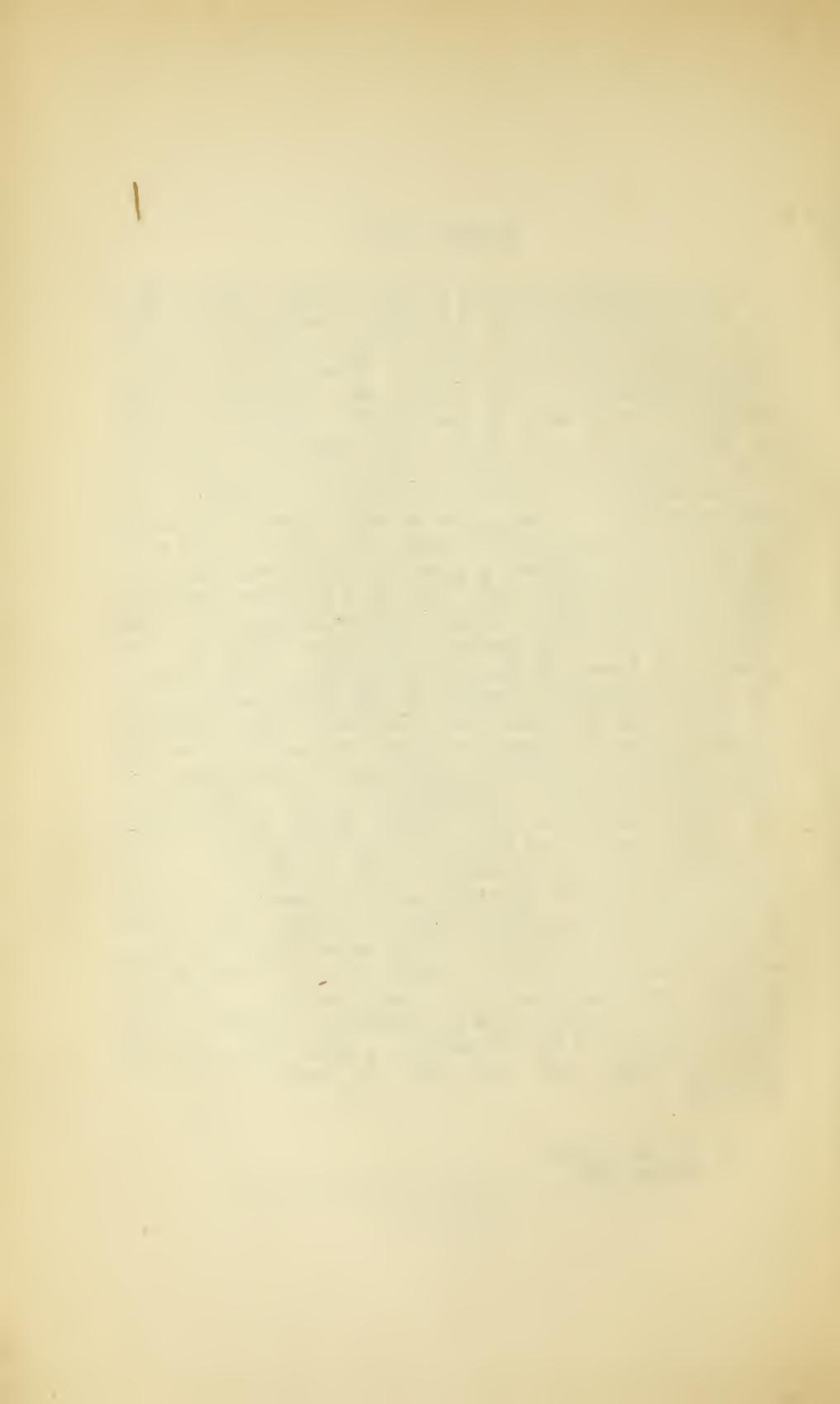
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PREFACE

IF an apology is needed for yet another War book it is, I claim, furnished by the subject-matter of this little work. Everybody knows something about St. Dunstan's, and the late Sir Arthur Pearson, shortly before his sad death, published in his *Victory Over Blindness* a very complete and detailed history of St. Dunstan's, its life, its work and its aspirations. Nevertheless, nothing has been published with regard to the nature and characters of the blindness on account of which St. Dunstan's came into existence. So long ago as May, 1920, I promised Sir Arthur Pearson that I would try to present the work at St. Dunstan's from a purely medical standpoint, so that there should be some sort of a technical record of Blindness among the British Armies during the Great War. The following pages, delayed by illness and the pressure of heavy work, are the result of this promise; but I am painfully conscious of the inadequate manner in which the task has been fulfilled. Much desirable information with regard to many of the cases has not been obtained, and much pathological investigation has been left untouched. Unfortunately, the exigencies of the times, when one was rushing about from hospital to hospital, prevented full advantage being taken of the wonderful store of material at St. Dunstan's. I can only say that I have done my best, by means of my notes compiled in those critical days, to classify and analyse the cases of War Blindness which came under my care, and to deduce from them certain lessons. For what is lacking I ask indulgence; and such as it is, I offer this result of my endeavour to the illustrious memory of the Great Founder of St. Dunstan's, a man whose life was given to others, that they, like he, should see light in darkness.

A. L.

12, HARLEY STREET,
October 1922.



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CHAPTER I

INTRODUCTORY

THIS little book is an attempt to give to the world a connected history of over five years' medical work amongst the war-blind at St. Dunstan's, from the time of its initiation in a house on Bayswater Hill in the latter months of 1914, to May 1920, by which time the vast majority of those blinded in the Great War by wounds or disease had come to the Hostel.

Firstly, and chiefly, it contains an analytical record of wounds or disease by which 825 men lost their sight in the Great War. Practically every man who was blinded in the War came eventually to St. Dunstan's. The large majority of cases of wound-blindness were in the first instance drafted into the 2nd London General Hospital (St. Mark's), where they were under the charge of Mr. (then Major) Arthur Ormond, C.B.E., who was associated with me in the work at St. Dunstan's from the time of its commencement until some time after the end of the War. From St. Mark's these men were passed on, as soon as they were sufficiently convalescent, to St. Dunstan's, where they continued under Major Ormond's charge.

My own share of the work was the care of all cases that came to St. Dunstan's from any source other than St. Mark's, and, as these included most of the cases of disease-blindness, the division of the work between us was fairly equal.

In the course of the War, Major Ormond had under his care at St. Dunstan's 1,008 blinded men, the total being made up of 30 commissioned officers and 907 N.C.O.s and men blinded by trauma, and 71 N.C.O.s and men blinded by disease. My own list totalled 825 cases, comprising 36 commissioned officers and 371 N.C.O.s and men blinded by wounds, and 418 men who lost their sight from disease.

The total number of cases of traumatic blindness who passed into St. Dunstan's was, therefore, 66 commissioned officers and 1,278 N.C.O.s and men, whilst the total of

those blinded from causes other than wounds amounted to 489 N.C.O.s and men. Neither Major Ormond nor myself had under our care a single case of a commissioned officer who lost his sight from disease.

The grand total of cases blinded directly or indirectly as the result of the War, estimated up to eighteen months after the Armistice, was 1833 men of all ranks. The comparison between the relative number of cases of disease- and wound-blindness shows that disease was responsible for a little more than 26 per cent. of the total number, a proportion which is appalling enough, and for which syphilis was very largely responsible. These statistics may, I think, be considered as fairly complete with regard to wound-blindness, but since May 1920, when I severed my connection with the Hostel, a certain number of cases of disease-blindness have been admitted, so that it is to be feared that when the final figures are available, the ultimate proportion between disease- and wound-blindness will be rather larger than that stated.

Besides these 825 cases of *total* incapacity from loss of sight, 225 more men passed through my hands at St. Dunstan's during the War, who for one reason or another were not eligible for admission. They included a large number of men with indifferent but useful sight who, as the fame of St. Dunstan's spread abroad, were anxious to press their claims to admittance and twelve months' hospitality without charge. A good many were what one might term "borderland" cases, men who retained just sufficient vision to enable them to do jobs not requiring a great deal of sight, such as messengers, caretakers, and so forth. Some of these "borderland" cases might have been considered eligible for admittance to St. Dunstan's. They formed a group of men who still retained a little useful and very precious sight, barely sufficient for earning any sort of living, and maintained so precariously that it would be endangered by the learning of handicrafts such as those taught to the blinded men. It would not do to take a man into St. Dunstan's who possessed some useful sight on his admission, and who could point out St. Dunstan's as the place where he had lost it entirely; so that very regrettfully I had to point this out, and to refuse these cases. More will be found with regard to this latter group in the chapter on Re-education.

Lastly, there were a number of pure malingeringers, who scented a chance of a pension, or who saw advantage in

the future of being able to claim that they had been to St. Dunstan's. Some of these cases were very tiresome and puzzling, because the applicants were much too artful to claim complete blindness, which they knew would soon become an impossible rôle, as well as a condition easily detected. They were generally sent up by some local committee upon whose charitable ignorance they had imposed, and they had a well-thought-out scheme of an imaginary knock on the head, after which the sight had faded. Many cases of blindness at St. Dunstan's were the result of injury to the visual cortex, and showed nothing by examination of the eyes themselves, so that a story of this kind had to be treated with caution. My usual plan in cases of difficulty was to assume that the man was what he said himself to be, and I admitted him to the Hostel with particular directions that he should be watched. For a few days all would go well, and then, after a little while, the man would almost always become careless and at times forget his part. For instance, he would be noticed walking to a chair and placing it in a convenient place for seeing an entertainment, or altering the time of his watch, or would give himself away in some other simple manner. But at one period of the War we were so bothered with these malingerers that we got a detective into the Hostel, who pretended to be a blind man. He played his part extremely well and proved a great success, speedily unearthing one or two cases about which we were doubtful.

After the formation of the Pensions Appeal Tribunal early in 1917, I undertook the medical side of the Pensions work at St. Dunstan's, which was very important, as by that time a very considerable number of men blinded by disease, who had been refused pensions, had been admitted. These men were very anxious, as indeed was the Hostel, to whom they looked entirely for support, to take advantage of the opportunity to re-state their cases once again. This side of St. Dunstan's work is detailed in a special chapter on Pensions, in which is also given a complete historical summary of War Disability Pensions for the Blind.

I have also added a chapter on the Re-education of the blinded soldiers as conceived and carried out at St. Dunstan's, which shows what a wonderful advance has been made in this direction. The impetus which the War has given to this great question will react as greatly to the advantage of the blinded civilian in the future as it has done and is still doing for the blinded soldier at the present.

Before closing this chapter and proceeding to the analysis of the various cases of blindness, which came under my observation and care, it may be of some interest to take a general survey of the daily routine medical work at St. Dunstan's. That the Hostel was concerned with medical work has scarcely been recognised, and this phase has quite rightly been kept in the background; for, after all, St. Dunstan's was never intended to act in any way as a hospital, and the public money so generously poured in for its support was not designed for the relief of wounds or disease for which the State held itself responsible. All the same, it quickly became obvious that a great deal of subsidiary medical attention would be required for the men. The vast majority of the wounded were suffering from some chronic trouble not severe enough to warrant their being detained in hospital, but generally of a nature that required daily care and treatment. Inflamed, discharging eyes and eye-sockets needed frequent bathings and irrigations, or other forms of dispensary treatment; mutilations involving the nasal sinuses, skull, face or mouth were numerous and needed constant care; whilst others, again, were suffering from old wounds or disorders of other parts of the body in addition to their blindness. Consequently, a large dispensary, staffed by a Sister, with a fully trained nurse and several V.A.D.s, was one of the earliest necessities of St. Dunstan's, and, when the number of cases increased beyond the capacity of the original house, a big bungalow annexe with a second dispensary and separate nursing staff was added. These two dispensaries, together with a small and less elaborately equipped one at the adjoining Baptist College, a building which was added to St. Dunstan's, made up our medical outfit at the Hostel itself. To each of the two dispensaries was added an adjoining consulting-room fitted with every requisite for dark-room examination, whilst in the dispensaries themselves were every convenience for daylight testing of the eyes as well as for applying any form of treatment prescribed.

A number of men were in poor health, and a visiting physician came daily to the Hostel to attend to the general well-being of the patients, and, as the numbers grew, it became necessary to get more help in this way, so that ultimately two doctors made each a daily visit. Naturally, too, with so large a community, there was some liability to outbreaks of illness, such as influenza and so forth,

so that at times the visiting physicians had much to do. This work was at first most ably undertaken by Dr. E. Chittenden Bridges; but later on, when the numbers grew large, he shared the responsibility with Dr. Arthur F. Gervis.

The usual medical routine on a case being sent to St. Dunstan's was that, in the first instance, a medical report was made by Mr. Ormond or myself, setting out the necessary history and medical details of the case, and prescribing any treatment that was needed.

However, in a large number of cases it was necessary to invoke outside assistance, and it is quite impossible adequately to express in words how magnificent a response was always forthcoming. Everybody in the medical world at that time was full of work, but nobody's work was too heavy to give help to St. Dunstan's when such help was needed. It is impossible to mention by name all those who at one time or another rendered assistance; for it not infrequently happened that a patient or his relatives would especially desire the advice of a particular physician or surgeon, and St. Dunstan's not being a hospital with a regular medical staff, effect was always given to any man's wishes in this respect. There are, however, certain physicians and surgeons to whom St. Dunstan's owes a very deep debt of gratitude, and who have done, and in some instances are still doing, a great deal of entirely gratuitous work for the men. I refer particularly to Dr. J. J. Perkins, Consulting Physician to St. Thomas's Hospital; to Dr. Campbell Thomson of the Neurological Department of the Middlesex Hospital; to Messrs. H. W. Mollison, C.B.E., W. H. Howarth, and Somerville Hastings, Surgeons to the Special Departments for Ear, Nose and Throat Diseases at Guy's, St. Thomas's and the Middlesex Hospitals respectively; to Mr. Mansell Moullin, C.B.E., Consulting Surgeon to the London Hospital; and to Sir Alfred Fripp, K.C.V.O., C.B., Senior Surgeon to Guy's Hospital.

Quite a large amount of operative work was needed, and it was customary during the first two years of the War to send such cases to various hospitals, where they received the necessary attention as in-patients, I myself utilising for eye operations my own wards at the Middlesex Hospital. Later on, when all the hospitals became extremely congested and the number of men at St. Dunstan's very large, a compromise was effected by securing a large house in the neighbourhood of St. Dunstan's, which was fitted up as a nursing home. This home accommodated 27 patients,

and it was always full. Many operations were performed there, and it proved to be an enormous boon, especially as it enabled an urgent case to be treated without delay.

It is certainly true to state that nearly all the men left St. Dunstan's in far better health than when they arrived, and, as regards their eyes, quite a number of cases proved amenable in some degree to treatment, with or without operative measures, as the case might be; so that they were able to leave the Hostel with their little sight made stable, and often distinctly improved. In a few cases, alas! a very few, the improvement was so great that it became no longer necessary for them to be treated and trained as blind men.

For those who fell out of health, or were convalescent, Homes were started at the seaside, notably at Brighton, where there were two houses, and at St. Leonards-on-Sea. These Homes were always full of men who revelled in the change to the seaside, and they were equipped with all the necessary apparatus and staff for administering any of the ordinary dispensary treatment, which, as above explained, most of the patients required. Very many of the men were apt to get neurasthenic at times, and for these cases the Homes had a great and special value, so that, looking back now, I can scarcely imagine what we should have done without them.

Some of the men were too old to be trained to handicrafts (*vide* chapter on Re-education), and for these, accommodation outside St. Dunstan's was found, whilst they were taught simple things such as string-bag making, netting, etc., which would give them something to do by which the time could be made to pass more pleasantly. There were others, again, far advanced in some constitutional disease, for whom serious training was impossible, and whose prospect of life was poor. St. Dunstan's took care of these men, and did all that could be effected to alleviate their lot until they went "West." Finally, there were a few terrible cases in which the man was not only blinded, but was very seriously mutilated in other ways as well, so that he could not be trained to any work. For these tragedies a permanent home at Cheltenham has been founded, where they will be kept in comfort for the rest of their days.

Death has already taken a large toll of St. Dunstan's men. When Mr. Ormond's list was compiled in 1919, 28 men had died since their admittance, and of those under my care 45 had died up to May 1920. Deaths associated

with disease-blindness far outnumbered those occurring among the wounded men, as would be expected.

With this brief survey of medical life at St. Dunstan's, I will pass on to analyse the various kinds of war-blindness which came under my observation, quoting at length only those cases which possess special interest. To relate every one of the 825 cases which I admitted into St. Dunstan's would involve the production of a large volume, much of which would be unprofitable reading.

The cases naturally group themselves into two main classes, *Traumatic* and *Non-traumatic*, and each main class will be discussed under the following headings :—

Traumatic.

- (a) Through-and-through penetrating wounds of the orbits.
- (b) Fractures of the skull causing blindness.
- (c) Concussion blindness without direct wound or penetration of the globe.
- (d) Miscellaneous cases of special interest.

Non-Traumatic.

- (a) Blindness caused by inflammatory diseases of the eye.
 - 1. Interstitial Keratitis.
 - 2. Other varieties of inflammation.
- (b) Optic nerve blindness.
 - 1. Primary optic nerve degeneration.
 - 2. Secondary optic nerve degeneration, following swelling.
- (c) Cases of detachment of the retina other than those in which detachment was of traumatic origin.
- (d) Miscellaneous cases, consisting of many varied groups of disease-blindness, which are most easily classified under this heading.

PART I
TRAUMATIC BLINDNESS

CHAPTER II

TRAUMATIC BLINDNESS

NUMBER OF CASES 407

General Remarks

A STUDY of the list of traumatic cases brings out a few general facts, and I think the first and most important one is the notable absence of sympathetic inflammation. I do not remember having seen a single case of sympathetic disease occurring in the other eye after the smashing of one eye by shell splinters or bullet wound. On the other hand, as we shall note later on, there were a few cases of blindness at St. Dunstan's, due to this disease, which occurred after some measure of operative treatment had been carried out on one eye. No special explanation, of course, is needed, for it is what one would expect according to the light of modern teaching, and is simply a link in the chain of evidence, which goes to show that sympathetic disease is a particularised form of sepsis. The missiles, shell or bullet, are absolutely aseptic when striking an object, and it was very interesting to note how quickly and cleanly eyes would heal even after wounds of the most appallingly destructive character. Numbers of cases came to St. Dunstan's with shrivelling, mutilated stumps which caused no trouble at all.

In the early stages of the War one was often tempted to insist upon enucleation of a destroyed eye in case there might be some risk to the other, which still retained a little sight, or which perhaps had not been wounded. Enucleation in such cases is always advisable, but frequently the patient would refuse to have the operation performed, so many men clinging to these deformed remnants in the hope that one day sight might come back. Consequently, against one's better judgment, many of these stumps were left alone, and I am bound to say I have never seen any harm arise from doing so. Later on in the War one realised that these shrivelled eyes might

be safely retained, and I ceased to urge enucleation except as a measure to relieve pain or lessen deformity.

A very large number of traumatic cases, as would be expected, suffered from antral, ethmoidal, or frontal sinus complications, which often worried the patient more than the loss of his eyes, and which were the source of endless trouble from a surgical point of view.

One interesting point was the extremely large number of cases exhibiting rupture of the choroid. The ruptures were often multiple and assumed many varieties of shape and position, though only in three cases was a solitary rupture seen on the inner side of the disc. It would seem as if there is some constitutional element in the choroidal coat which renders it especially liable to split; for a large number of cases showed no injury to the eye beyond one or more ruptures of the choroid, accompanied by neighbouring concussion changes in the form of proliferated pigment and retino-choroidal atrophy. These cases made it apparent that the choroid can be ruptured not only from blows delivered in front, but also from blows applied from behind, and in *each* way it can, and does not infrequently, occur without causing a consecutive detachment of the retina or interference with the crystalline lens. Of course, many cases exhibited a retinal detachment or other severe injury associated with the choroidal split, the curious point being that it is possible for the latter to occur as practically the only visible sign of a severe blow.

The vision of many of the cases in this traumatic series has been somewhat improved by operative treatment since the notes were made. In nearly all, such improvement was the result of dealing successfully with cataractous lenses or pupils blocked by dense capsule and lens débris. Many of the cases, on the other hand, who still retained a little sight when they first came to St. Dunstan's, have since become completely blind.

(a) THROUGH-AND-THROUGH BULLET WOUNDS OF THE ORBITS

I have notes of 72 cases of this variety of injury. Very often, and perhaps most commonly, both eyes were smashed by the bullet and had to be removed. This seems to have been the usual case when the bullet took a horizontal line through the temples. When the pene-

tration was oblique one eye often escaped absolute destruction, and in a few instances retained some useful sight. As would be expected, if the line of penetration was from behind forwards, it was more usual for the eye on the side of entry to escape total destruction, whereas if the bullet passed obliquely from before backwards it was the eye on the exit side that might escape, the other being invariably smashed. Very frequently, in fact almost always, the optic nerve was very badly injured in both eyes, and in a large number of cases it was probably severed.

The question arises as to whether it is possible to diagnose from inspection what has exactly happened to the optic nerve in these cases of orbital penetration by bullets, when one eye has escaped destruction and can be examined. I think the answer is, that in some cases it is certainly possible positively to affirm that the nerve has been severed, and in some cases positively to affirm that it has not been cut through; but that in a very considerable number we can only infer the probability of severance from collateral evidence.

There are 23 cases in the series, all of which presented exactly the same picture, the media being sufficiently clear for precise examination. In each one the eye was totally blind. Surrounding the disc, and partially or in some cases totally eclipsing it, was a large protruding mass of woolly-looking white exudate, often permeating the retina and in places pushing it forward. Frequently the mass was seen to be flecked with recent haemorrhage, even though many weeks had elapsed since the injury. In nearly all the cases the exudate had tended to gravitate downwards to the lower portion of the fundus, so that the greater part of it below the level of the disc was completely masked. The disc itself, or what could be seen of it, was of a papery-white colour. Bordering the white mass were usually to be seen evidences of severe concussion in the formation of a zone of varying width, covered diffusely by patches of retino-choroidal atrophy mottled with pigment. Each one of the series was so similar that one felt that the causal factor must be the same for all, and I have no doubt that the picture indicated the complete severance of the optic nerve close to the lamina cribrosa.

Cases where the nerve has been avulsed or torn away bodily from the globe have been diagnosed clinically and

described by Sir W. Lister and Hine.¹ The condition was probably present in Case 243, described on p. 37, but none of the through-and-through cases in my list exhibited this extraordinary accident.

In some cases, the ophthalmoscopic picture a few weeks after the injury was that of a white wasted nerve forming the centre of an area of diffuse atrophic and pigmentary change without any evidence of any exudate about the nerve-head. This condition, coupled with a history of instantaneous and complete eclipse of vision at the time of wounding, constituted very strong presumptive evidence of severance of the nerve far back in the orbit.

One could, of course, positively affirm that the nerve had not been severed, however atrophic it might appear clinically, if the patient at any time subsequent to the injury retained a little sight. Very often there was a great deal of orbital haemorrhage and proptosis of the eyes immediately following the wound, and in these cases the optic atrophy was no doubt due to wounding of the nerve without severance, or to the pressure of a severe orbital haemorrhage, or to the action of both causes.

An interesting feature about many of these through-and-through wounds was the comparatively slight physical disturbance which they caused the patient. As a rule the wound-passage gave no trouble at all, and it was seldom that the patient suffered much actual pain. Of course, ethmoidal complications were very general, but quite a number of my own cases escaped any serious trouble in this direction. Nerve disturbance was usually surprisingly slight, some patients not even suffering from any headache. On the other hand, I have observed certain late mental changes in a few of these cases, which consisted of an alteration in the temperament or character of the patient, often indefinable, and always of a degenerative nature. Thus a man strictly abstemious before his wound would take heavily to drink; a good-tempered man would become hasty, choleric and unreasonable, and a placid man subject to fits of uncontrolled rage on trifling grounds. Such temperamental changes may occur after any severe head injury, but in these cases of extreme anterior perforation of the skull the damage to the cerebrum, if any, must have been very limited, and confined to the anterior extremities of the frontal lobes.

One would have expected that even if an eye escaped

¹ *Trans. Ophth. Soc. U.K.*, Vol. XXXIX., p. 196.

total destruction the injury inflicted on the orbital contents by a bullet would have been so severe as to bind the eye back in the orbit, producing enophthalmos and more or less fixation of the globe. This condition of affairs did in fact generally happen when the eye was smashed, but quite a number of less damaged eyes regained good movement and showed neither proptosis nor enophthalmos.

The comparative frequency of through-and-through bullet wounds—in my own list the proportion is over 17 per cent. of all cases of blindness from trauma—seems to point to some alteration in the steel helmet as advisable; a brim a little broader and set more obliquely would add little to the weight and a good deal to the protection of the skull.

The following cases of through-and-through wounds possess some special interest :—

Case 47. J. H. Aged 23. R. eye removed. L. v.¹ = 6/60.

This is an instance of useful vision being retained in one eye. The bullet entry was just behind the right orbital margin with exit on the left cheek below the orbit. The right eye was smashed. The left fundus presented an unusual picture. It seemed to indicate that the bullet had grazed the posterior pole of the eye on the inner side of the nerve, injuring the nerve but leaving the outer and upper portions of the globe uninjured. There was a large puckered scar involving the upper and inner angle of the disc, which was pale, and a broad halo of atrophy surrounded the disc elsewhere. There was much concussion change in the visual coats below and to the inner side of the disc, *but elsewhere the fundus was normal*. The lower and inner segments of the visual field were good and complete right up to the fixation point, but the rest of the field was completely eclipsed.

Case 89. C. V. S. Aged 39. R. eye removed. L. eye blind.

This was a transverse penetrating wound of the temples. The left disc was very pale and shrunken with obliterated physiological cup and rather pale small vessels. It was surrounded by a broad halo of choroidal atrophy, and no other lesions were present. The picture and history suggested that the nerve had been severed by the bullet far back in the orbit behind the site of entry of the central

¹ R. v. and L. v. stand for Right and Left vision; p. l. for "perception of light."

retinal artery, and that the globe was untouched. The exit wound of the bullet on the left side was considerably behind the line of entry.

Case 133. G. B. Aged 23. R. eye removed. L. v. = counts fingers at short range.

A shell splinter pierced the skull just behind the left ear and made its exit through the right orbit, the right eye being smashed. The left eye was very considerably proptosed, and there was much limitation of movement in all directions, except inwards. The protrusion was so great that the lids were sutured over the eye, leaving a small central gap through which the patient could see to get about. The cornea was very hazy, and the patient experienced a great deal of trouble from a chronic mucopurulent conjunctivitis. Deep examination of the eye was not possible, but evidently there had been severe retro-ocular haemorrhage and injury to the cone of muscles. The haziness of the cornea was probably due to exposure before the suturing of the lids.

The lids had been closed for several months before I saw this case, and the vision apparently had become no worse. During the man's stay at St. Dunstan's the eye remained in much the same condition without any diminution in the proptosis. The discharge could be limited by daily irrigations, and there seemed to be no reason why he should not retain permanently the little sight still left to him.

Case 207. H. G. Aged 24. R. v. = 2/60. L. eye removed.

The bullet entered through the right cheek an inch and a half behind, and half an inch below, the external orbital angle, and, passing upwards, emerged through the left orbit and eye, which was smashed. *The interesting point was the comparatively slight amount of damage to the right eye.* The media were quite clear, and the only fundus lesion was a large horizontal rupture of the choroid, which ran from the macula, which was involved, close to the outer edge of the pale disc. The central vision was very poor, but there was a good peripheral field.

Case 221. H. H. Aged 21. R. v. = p. l.¹ L. eye blind.

The bullet perforated near the angle of the right lower jaw, and, passing upwards and to the left, emerged through the bridge of the nose, which was smashed. The right disc was pale and there were several large pigmented

¹ See note, p. 15.

plaques of choroidal atrophy round and about the macula. In the left eye the disc was also very pale and the lower half of the vitreous chamber was full of organised exudate, which had clawed away the retina. There was complete loss of smell. Probably both inner orbital walls had been smashed by the bullet with direct injury to both optic nerves, the left nerve being cut completely through. The globes themselves could only have been grazed, and possibly were not touched by the bullet at all.

Case 251. J. L. Aged 22. R. eye removed. L. v. = p. l.

The bullet passed through the right orbit, making its exit through the left cheek two inches behind the external orbital margin and a little below it. The right eye was smashed. The left media were clear, the disc very atrophic, and there were mottled concussion changes involving the macula and immediately surrounding parts. There was a little old exudation round about the disc, but none elsewhere. The wound of exit lay so far back that it was certain that the bullet could only have passed through the extreme posterior portion of the orbit, and probably the nerve was just grazed and the eye itself not touched.

Case 261. S. M. Aged 44. R. eye removed. L. v. = 6/24.

The bullet passed through the left orbit, making its exit through the right orbit and smashing the right eye. The left media were clear and the disc was very pale. The upper half of the fundus showed extremely severe concussion changes, while the lower half was quite healthy. This was a very unusual picture. Probably the nerve was just touched, the globe itself escaping, or possibly slightly grazed. It was the only case I saw in which signs of concussion were confined to the *upper* portion of the globe; in every other case concussion changes were either at the macula, which had escaped in this instance, and parts round it, or in the fundus below the macula.

Case 300. H. P. Aged 23. R. v. = p. l. L. v. = fingers at short range.

The bullet passed through the right temple about two inches behind the external orbital margin, and passed nearly transversely through the skull. An extremely interesting point about this case was that *neither* eye was completely blinded. In both eyes the media were clear. The right fundus showed massive white exudate about a white disc and over the lower fundus, with the usual intense pigment proliferation surrounding the exudate. The left disc was

of fairly good colour and there was very little exudation to be seen; but there were extremely severe concussion changes on both sides of the disc involving the macula. The appearance suggested multiple radiating ruptures of the choroid. It was evident that the bullet must have passed through the extreme posterior portion of each orbit, injuring both nerves, but barely, if at all, touching the globes.

Case 319. E. S. Aged 18. R. eye removed. L. v. = 4/60.

The bullet entered the right orbit just below the outer limit of the eyebrow, and, passing slightly backwards, had exit one inch behind and on a level with the left eyebrow. The right eye was smashed. The left eye exhibited gross concussion changes scattered in every direction over the fundus, and consisting of areas of retino-choroidal atrophy, some of which were densely white, whilst there was a great deal of mottling by irregularly shaped masses of pigment. The disc was of good colour and there was no sign of any exudation.

This case seemed to point to a very rare accident, in which the eye was grazed, but the nerve untouched. It will be noticed that the line of the wound was extremely high, and that the exit wound was on a slightly higher level than the entry. Evidently the bullet passed right over the nerve, just grazing the top of the globe in its passage.

Case 329. J. S. R. eye removed. L. v. = p. l.

A bullet entered the right eye and emerged through the left temple, about two inches behind the external orbital margin. The lower half of the left fundus was much disorganised by severe concussion changes; the disc was extremely pale. The upper half of the fundus was quite healthy and there was no sign of any exudation. Probably the nerve was injured by the bullet in its passage across the orbit, the eye escaping altogether or just grazed.

Case 342. L. E. T. Aged 34. R. eye blind. L. v. = 6/60.

This was an extremely curious case. A shrapnel bullet penetrated the right orbit through the temple, destroying the right eye, which was blind and shrunken, with the vitreous chamber full of organised exudate. Passing through the nose the bullet had remained lodged in the left orbit. Eight months had elapsed since the wound, and the left eye was quite quiet and there was no sign of inflammatory disturbance of any kind. The central region

of the fundus was much disorganised by concussion changes, and there had been a great deal of swelling of the disc, which was atrophic.

The lateral movements of the eye were good, but it tended to roll up, and there was some difficulty in infraduction. The visual field showed complete loss of the outer half right up to the centre, but complete retention of the inner half. The tension was rather minus. Six months after this note was taken I remarked that the eye was remaining perfectly quiet, and that the bullet was causing no symptoms. The tendency of the eye to roll up had disappeared, and there was no difficulty in infraduction. The vision remained as before.

(b) FRACTURES OF THE SKULL CAUSING BLINDNESS

These may be divided into two sections :—

1. Fractures of the occipital portion of the skull.
2. Fractures of the skull other than occipital.

1. Fractures of the Occipital Region of the Skull

These form a very interesting group. I have notes of seventeen cases, and in every instance the man was quite disabled. One or more decompression operations had been performed in several of them, and in some there was a large cerebral hernia. Most of the cases were caused by shattering of the skull with shell splinters, but in a few cases the wound was a through-and-through perforation of the skull by a bullet.

It will be noted that in several cases the patient was quite blind for a varying time after being wounded, and also that there was not infrequently a prolonged period of total unconsciousness.

In three of the cases the visual fields had normal limits, but in all the others it was almost wiped out, except for a small area round the fixation point. In two of the cases which I am going to relate, the central vision was perfect, but the central fields in each case were so restricted that the patient suffered almost as severely as if he had been quite blind. Practically the situation was that the patient could see a tiny bit of a face, or any object at which he was looking, as if through a peephole. If he attempted to walk down the street by himself, suddenly an eye would come out of the blackness, or a bit of a nose, a small part of a taxi,

or some other object, which would as suddenly disappear; with the result that the patient got into a state of extreme nervousness and was happier when he kept the eyes shut. In fact, fragmentary vision of this kind, even when amounting to 6/5, is almost useless to the patient, and he would be much better off with central vision of 6/60 and a comparatively unrestricted field.

None of these cases showed any tendency to improve during their stay at St. Dunstan's; but, on the other hand, all have kept what little sight they still retained when they first came there. Many of them suffered a good deal from headache, and the latter was almost always a sequel after going out for long walks, or after a visit to a theatre, or, in fact, after any occasion when there was much effort at concentration of vision or mind.

Only one of them exhibited any other form of nerve symptoms, and he suffered from a partial right hemiplegia. Several of the cases in which the field could be mapped with any sort of accuracy, exhibited a tendency to homonymous hemiopia, and in some I noted that the colour-sense was almost or entirely obliterated.

In ten of the cases nothing at all was to be observed by examination of the eyes themselves; but in the remaining seven cases the nerves were pale and evidently atrophic, and in one of these there had been some swelling preceding the atrophy.

In one instance there were marked concussion changes in one eye, the causal origin being doubtful. It certainly could not have been due to the occipital wound, and was probably the result of a severe blow on the eye itself, though there was no history of any such injury, nor was there any scar on the face.

Much light has been thrown on the subject of injuries to the visual cortex by the war-researches of Dr. Gordon Holmes and Sir W. Lister,¹ and, as the matter is full of interest, a brief account of all the cases that came under my observation is given below.

Case 28. W. E. Aged 40. A shrapnel wound of occiput. R. v. = 6/5. L. v. = 6/5.

Decompression operation and removal of large area of bone. He was totally blinded for some days after being wounded. Eyes quite healthy. The central vision was perfect (6/5) in each eye, but the fields were entirely wiped

¹ *Brain*, Vol. XXXIX., p. 34.

out except for a tiny area round the centre, which only permitted fragmentary vision of an object. He was therefore quite incapacitated.

Case 35. H. G. Aged 24. Shell wound of occiput.
R. v. = 6/6. L. v. = 6/60.

Unconscious for about a week after being wounded, and for some weeks was totally blinded. He then gradually began to improve, and in about six months had recovered the present amount of sight. Three years had elapsed since he was wounded. The eyes were perfectly healthy. The field was intensely contracted, and limited to an area of two or three degrees around the fixation point.

Case 86. P. R. Aged 20. Shell wound of occiput.
R. v. = 6/60. L. v. = 6/60.

Decompression operation and removal of a considerable area of bone over occiput. In the right eye the field for white was normal, but there was a large relative central scotoma with fair colour-sense, the colour fields being extremely reduced. In the left eye the visual field seemed to be wiped out except for a tiny area round the fixation point; but at the immediate centre the colour-sense was quite as good as in the right. The eyes were quite healthy.

Case 104. A. U. Aged 31. Shell wound of occiput.
R. v. = fingers at short range. L. v. = ditto.

Decompression operation, with removal of three pieces of shrapnel from the skull. The patient did not notice any deterioration of his sight until about three months after the wound. The discs were rather pale and probably there was some atrophy; there was no sign of previous swelling. Both fields showed annular contraction up to ten degrees of the fixation point. This was a specially interesting case, because it was the only one in which the failure of sight did not follow immediately upon the wound, and I think there is some doubt as to whether the visual centres were really injured. It is more probable that the explanation of his blindness lies in some injury anterior to the wound itself, causing haemorrhage and pressure on the chiasma.

Case 107. J. L. W. Aged 20. Wound of occiput by aeroplane bomb. R. v. = 1/60. L. v. = 1/60.

The patient had had a decompression operation, and presented a large pulsating cerebral hernia about the size of a Tangerine orange, just to the left of the mid-occipital

line. Eyes perfectly healthy. The fields exhibited homonymous hemiopia with complete obliteration of the right outer field from the 10-degree circle, whilst on the left side the inner field was similarly wiped out beyond this point.

Case 121. B. T. A. Aged 38. Shell wound of occiput. R. v. = 4/60. L. v. = 1/60.

There was a large tender occipital scar. The eyes were perfectly healthy. The right field was entirely obliterated except for a minute circle round the fixation point. The left field was similarly affected, except that in this case there was also a small range of movement-sense, extending to the left of the centre.

Case 154. W. H. C. Aged 28. Shrapnel wound of occiput. R. v. = 3/60. L. v. = fingers at short range.

In this case I noted that there was a complete loss of colour-sense. Both fields were contracted up to the 20-degree circle from fixation point. This man exhibited some weakness of the right arm. Plantar reflexes normal. The eyes were quite healthy.

Case 197. J. F. Aged 42. Through-and-through bullet wound of occiput. R. v. = p. l. L. v. = p. l.

There were two scars about four inches apart showing where the occiput was perforated by a machine-gun bullet. The case-sheet described oozing of cerebro-spinal fluid for a time, and the patient was unconscious for fourteen days. The right disc was pale and atrophied. In the left eye the fundus reflex was very poor, and no details could be made out, but concussion changes and haemorrhages were reported. The sight was too poor for any fields satisfactorily to be mapped. He seemed to have no perception of light at the immediate centre. Here again, as in Case 104, the cause of blindness was not altogether clear. Obviously, I think, a great deal must be put down to concussion. He probably struck his head a severe blow when he was wounded.

Case 208. R. W. G. Aged 23. Shell wound of left vertex and occiput. R. eye blind. L. v. = p. l. (eccentric).

There had been a decompression operation, and there was a large cerebral hernia. The man was unconscious for fourteen days after being wounded, and totally blind for about two months. He remained totally blind on

the right side, but regained a small eccentric field of form-sense on the left. The outline of both discs was blurred, and the discs themselves were atrophic. Evidently there had been some previous papillœdema. He had suffered from partial right hemiplegia, but no other nerve signs. The case suggested that there had been a considerable amount of intracranial pressure, which was the cause of the swelling and subsequent atrophy of the discs.

Case 232. G. E. J. Aged 26. Shell wound of occiput.
R. v. = p. l. L. v. = p. l.

There was a large occipital scar. The man was unconscious for four days, and totally blind for sixteen days. The eyes were perfectly healthy. The sight was so bad that the fields could not be mapped with any sort of accuracy. He seemed to have a good range of light-projection in both, but nothing more, and he could not count fingers at any range. Matters had been quite stationary for the last twelve months.

Case 306. S. C. P. Aged 21. Shell wound of occiput.
R. v. = 6/60. L. v. = 5/60.

There was a very large gap in the occiput with a cerebral hernia. Both nerves were pale and atrophic, no other lesions being present. On the right side the field was limited to a small area of form-sense above the horizontal mid-line, which was prolonged on the outer side to the 50-degree circle. On the left side there was only a very small area of the upper field slightly prolonged to the inner side. All below the horizontal mid-line was lost in both eyes. There was therefore a tendency to homonymous hemiopia.

Case 364. C. W. Aged 34. Through-and-through bullet wound of occiput. R. v. = fingers at short range. L. v. = ditto.

There had been a horizontal penetration of the skull one and a half inches behind the mastoid processes and on a level with the summit of the ears. The eyes were perfectly healthy. The visual fields had normal limits, but only for movement-sense. He seemed to have no form-sense anywhere beyond a tiny area situated round the fixation point. The condition of his sight had not changed for many months. He noticed that it had not appreciably changed since the time when he first recovered consciousness.

Case 371. A. C. Aged 23. Bullet wound of occiput.
R. v. = 6/5. L. v. = 6/5.

Decompression operation with removal of large part of the occipital bone. The eyes were quite healthy, and he had 6/5 vision in each, but the central field was so extremely contracted that he could barely see two letters of 6/5 at a time, with either eye or both together. He was quite unable to go out unattended, nor could he read a book. He suffered a great deal from headache after any attempt at much concentration of sight. The visual fields were very interesting. There was a large sectorial scotoma invading the right inner and the left outer fields after the manner of homonymous hemiopia (quadrantic hemiopia). In each field it ran right up to and surrounded the tiny central area of clear vision. Traced from the centre it at first formed a narrow ring round the fixation point and then expanding fan-wise eventually occupied the greater part of the right inner and a somewhat smaller portion of the left outer field. Round the centre and over all its limits except at the extreme periphery, where there was a shallow area of some movement-sense, the scotoma was absolute. Beyond the scotomatous area the fields had normal peripheral limits, and there was a general though rather foggy form-sense.

A note made three years after his wound showed that his condition was absolutely unchanged.

Case 380. H. A. T. Aged 20. Shell wound of occiput.
R. v. = fingers at short range. L. v. = p. l.

Decompression operation. Was completely blinded for some weeks after the wound. The discs were pale and atrophied. The fields were extremely restricted in every direction and could not be mapped out with any accuracy, but there appeared to be a tendency to left homonymous hemiopia. A note taken two years later showed that the vision remained exactly as above described. He was then getting epileptiform attacks about every six weeks.

Case 382. A. K. N. Aged 40. Shrapnel wound of occiput. R. v. = 2/60. L. v. = 1/60.

Six decompression operations. Nerves pale. He had an extreme restriction of both fields to form-sense, and had very little sense of colour. Movement-sense was very much more restricted on the right side than on the left, and the fields, therefore, had the character of a homonymous hemiopia.

Case 400. J. A. K. Aged 27. Bullet wound of occiput.
R. v. = 3/60. L. v. = 6/60.

Two decompression operations. Was quite blind for some weeks after being wounded. The discs were rather pale. Both fields were obliterated up to the 5-degree circle round the fixation point. This patient died some months later from epilepsy.

Case 403. W. M. Aged 34. Shell wound of occiput.
R. v. = p. l. L. v. = p. l.

This man had excellent projection in both eyes right up to normal limits, but his field for form was obliterated except for a tiny circle round the fixation point. He had absolute loss of all colour-sense. The eyes were perfectly healthy.

2. Fractures of the Skull other than Occipital

This group consists of a collection of twelve cases, of which the majority were smashing blows on the frontal region.

These frontal fractures were either central or lateral, and in both cases nearly always involved one or both frontal sinuses. Four of them were wounds of the parietal portions of the skull, whilst one was a fracture of the vertex. I append a short account of each case, as they are all interesting.

It will be noted that most of the frontal fractures caused blindness of one eye by directly smashing it, whilst the other eye was injured in a variety of ways, either directly, by fracture of one of the walls of the orbit with injury of the orbital contents by spicules of bone and haemorrhage; or indirectly, by concussion effects; or thirdly, by direct injury and concussion acting together.

The involvement of the frontal sinus was a very troublesome complication, producing a suppurating fistula which persisted for an indefinite time and needed constant attention. I did not notice in any of the frontal cases any general nerve symptoms, and they did not seem to have any particular effect upon the patient beyond the loss of sight and the inconvenience caused by frontal sinus involvement. On the other hand, one of the cases in which the parietal region was fractured exhibited mental symptoms for many months after wounding.

Case 25. G. C. Aged 29. R. eye blind. L. eye blind.

This was a case of a shell wound over the left parietal region. A decompression operation had been performed with the removal of a large area of bone. Both discs exhibited advanced non-inflammatory optic atrophy, and there was marked nystagmic jerking of the eyes. His mental condition was very bad for some months after he was wounded. The cause of the optic atrophy was not clear. There were no signs of any concussion of the eyes or of any increased intracranial pressure in the past. Probably his sight failed gradually, but owing to his mental condition no history could be obtained with regard to this point.

Case 265. W. M. Aged 38. Through-and-through bullet wound of the parietal regions. R. v. = 6/36. L. v. = 6/60.

The bullet perforated the left parietal region just above the summit of the ear, and made its exit two inches above and one inch behind the right ear. He was more or less unconscious for about two months after his wound. He had some sight on recovering consciousness, but it failed very rapidly. The discs were pale, and showed no signs of any past swelling. The vessels were normal and there were no other lesions, nor any sign of other affection of the nervous system. He was quite sure that the sight was perfectly normal before he was wounded. The fields showed annular contraction right up to a few degrees from the fixation point.

In this case, again, the cause of blindness was uncertain. He was scarcely a case for St. Dunstan's, because he could find his way about quite easily, but his fields were so restricted that it was impossible for him to earn a livelihood and so he was admitted. I have some doubt as to whether he ultimately became blind, but whilst he was at St. Dunstan's he retained a certain amount of sight.

Case 311. H. R. Aged 18. R. v. = fingers at short range. L. v. = p. l. (eccentric).

This is another case of through-and-through bullet wound of the parietal region of the skull. The bullet passed horizontally through the skull two inches behind and on a level with the summit of the ear on each side, so that the line of injury was very near the occipital bone. Pulsating scars marked the entry and exit of the bullet. Both discs were a little pale, otherwise there were no fundus changes. There were no signs of previous swelling of the nerves. Both fields were extremely restricted, that on the right

side being confined to a small nasal field running inwards from the fixation point, whilst on the left side the field was eccentric and purely external. The centre was completely destroyed on the left side and partially so on the right. Thus the fields suggested homonymous hemiopia, and probably the cause of blindness was injury to the visual cortex. The pupils were both equal and active.

Case 345. W. H. T. Aged 29. R. v. = fingers at short range. L. eye blind.

This was rather a complicated case in which there was a fracture of the frontal bone and a bullet wound of the skull, suggesting that he was wounded twice. There was a depressed scar on the forehead, and another just in front of the left external auditory meatus, where the bullet was extracted from the skull five days after the wound. The right disc was extremely pale, without any other lesion being present. The left disc was also very pale, and the central region much disorganised by atrophic and pigmentary changes, the result of severe concussion. The history of loss of sight was very vague. Failure began very soon after he was taken into hospital. The right field exhibited two small islands of form-sense, one stretching from the centre upwards and inwards, whilst the other lay on the outer side close to the centre, but entirely eccentric. Elsewhere the field was wiped out. The case suggested that the fracture of the frontal bone was the cause of the blindness, the latter being probably due to involvement of the nerves by direct extension of the fracture.

Case 374. W. H. Aged 27. R. v. = p. l. L. v. = p. l.

This was a case of shell wound of the vertex of the skull. There had been a decompression operation, with the removal of a large area of bone. The discs exhibited advanced simple atrophy, with no sign of previous swelling. No other lesions were present. The fields were concentrically contracted almost up to the fixation point. He had lately developed epileptiform fits. The immediate cause of blindness was obscure. It seemed to have come on fairly quickly after he was wounded. It was probably only indirectly due to the fracture itself.

The following cases are all concerned with smashes of the forehead, without injury to any other part of the skull.

Case 68. H. J. M. Aged 31. R. v. = p. l. L. v. = p. l.

This was a case of fracture of the frontal bone in the mid-line. The wound had healed perfectly, and there was

no trouble from frontal sinus complication. Both discs exhibited great pallor, with signs of old mild swelling. There was little doubt that blindness was due to extension of the fracture backwards with involvement of the nerves at their entrance into the orbits.

Case 124. C. A. Aged 31. R. v. = 4/60. L. v. = p. l.

This was a case of a shrapnel fracture of the frontal bone in which a decompression operation had been performed. The man exhibited some weakness of the right arm and leg, and was extremely neurasthenic. Both discs exhibited a simple primary atrophy, but he was extremely difficult to examine. He walked about with his eyes shut, and declared that he was unable to open them. The wound had healed well, without any frontal sinus complications. In this case, again, the blindness was probably due to direct involvement of the optic nerves by extension of the fracture backwards.

Case 164. C. C. Aged 21. R. v. = p. l. L. v. = fingers at short range.

This was a very interesting case of an extremely extensive fracture of the forehead. A decompression operation had been performed, and a very large area of bone removed. The sight began to fail a few weeks after the wound. The patient had a very tender pulsating scar, and was subject to frequent fits. The fits were of an epileptiform character, and were probably due to thickened and adherent membranes. There had been no nose or sinus trouble. The nature of his blindness was extremely difficult to explain. The nerves were of normal colour and the vessels healthy, and there were no lesions in the fundi. The fields were extremely restricted on both sides, and each exhibited the same characteristic. The nasal fields extended only to the 10-degree circle from the fixation point, whilst the temporal fields extended as far as the 30-degree circle, as if there was a suggestion of a bi-nasal hemiopia. His colour-sense was extremely poor for green, but seemed to be fairly normal for all other colours. The patient was an extremely intelligent lad, and there was no question of malingering; but there was nothing in the eye-picture to suggest the cause of loss of sight, nor did there seem to be any direct association between his blindness and the fracture, which was amenable to any ordinary explanation.

My own impression is that the smashing blow which he received was of so severe a character as to cause injury by concussion, or possibly by haemorrhage, to his visual cortex, and that his blindness was due to this cause.

Case 218. W. H. Aged 27. R. eye removed. L. v. = p. l. (eccentric).

This was an unusual case, in which the injury was due to a kick on the forehead by a horse. There was an irregular linear scar about three inches in length over the right supra-orbital ridge and root of nose, which was smashed. The right eye was destroyed at the same time as he was kicked, and was removed shortly afterwards. The left fundus exhibited a large mass of white exudate, spreading in all directions from the disc, which was completely buried by it. Evidently the left orbital wall was smashed and the nerve severely lacerated, probably by a spicule of bone. The fundus appearance was exactly comparable with what one was accustomed to see after a through-and-through penetration of the orbit by a bullet. A skiagram of the skull showed nothing definite. His general nerve condition was good, except that he had suffered from a good many epileptiform fits since his accident.

Case 238. W. C. J. Aged 23. R. eye removed. L. v. = p. l.

This was a case of shell wound of the forehead and root of the nose. The nature of the injury to the right eye which caused its removal was not known, but probably the eye was smashed at the time he was wounded. This was another difficult case. The left eye appeared perfectly healthy and the disc was of a good colour. The visual field was extremely restricted and confined to a small circle round the fixation point. The patient was subject to very bad paroxysmal headache. I think this case is to be explained in a similar way as Case 164, and that his blindness was due to severe concussion and injury of the visual cortex, and only indirectly associated with the frontal smash.

Case 299. S. P. Aged 32. R. eye blind. L.v. = 1/60.

The forehead had been very badly smashed by a shell wound, leaving a large cup-shaped depressed scar. The sight began to fail in both eyes about three months after the wound. The pupils were semi-dilated and immobile. The fundi exhibited advanced simple atrophy of both discs, with much shrinkage and cupping of both nerves. No other lesions were present, and the loss of sight was without doubt due to direct involvement of the nerves by extension of the fracture backwards.

Case 368. A. N. Aged 20. R. eye removed. L. v. = 6/18.

This man was wounded by a shell splinter, which caused an extensive fracture of the forehead and root of the nose, by which the right frontal sinus had been exposed. There was a large depressed scar and a discharging sinus. The right eye was smashed at the time he was wounded and removed. The left eye exhibited a large rupture of the choroid near the macula, with much atrophic and pigmentary change between the macula and disc, which was pale. The field was considerably restricted in every direction, and there was an absolute annular para-central scotoma, which ran very close to the fixation point externally and below. Here again, as in Cases 164 and 238 above described, some consecutive injury to the visual cortex may be the explanation of the latter phenomenon. It certainly could not have been caused by the choroidal rupture.

I have been able to watch this case for about three years, and it has improved considerably, so that the vision is now 6/12. The para-central scotoma has shrunk very much, though still present: elsewhere the field has normal limits, except externally, where there is a sectorial contraction extending to within 20 degrees of the centre. The fundus appearance remains unaltered. It might appear that this case was unsuitable for training as a blind man; but the loss of one eye and the para-central scotoma in the other, made it practically impossible for him to earn his living in the ordinary way of a sighted man.

CHAPTER III

TRAUMATIC BLINDNESS (*continued*)

(c) CONCUSSION BLINDNESS WITHOUT DIRECT WOUND OR PENETRATION OF THE GLOBE

THIS group contains sixteen cases, all of which will be quoted shortly, as they are very interesting.

Case 56. F. E. K. Aged 25. R. v. = 6/60. L. eye removed.

This man was injured by the explosion of an aeroplane bomb, which affected his left ear and both eyes, and wounded the vertex of his skull without fracturing it. The right eye exhibited severe concussion changes of the usual character, viz. spotted atrophy and pigment proliferation. These changes were scattered all over the central area, leaving the more peripheral portions of the fundus quite healthy. The disc was pale from a primary atrophy of the nerve.

Case 119. J. A. Aged 27. R. v. = p. l. L. v. = p. l.

This man had a very unfortunate history. He lost the sight of the right eye by a blow from a clod of earth. At some later date he was suddenly blinded in the left eye as the result of a shell-burst close to him. The right fundus exhibited a long vertical linear rupture of the choroid, close to the fovea and about three papillo-diameters in length. There were no other lesions whatever. In the left eye there was a general detachment of the retina with hazy vitreous.

Case 165. C. M. Aged 30. R. v. = p. l. L. v. = p. l.

This man was blown up and buried by a shell. He was unconscious for about half an hour. The vitreous was very hazy in both eyes, and fundus details, which were indistinctly visible in the right, were quite obscured in the left. Probably there had been severe intra-ocular haemorrhage. The right fundus exhibited profound concussion changes about the macula, with fan-like wrinkling of the retina, indicating a small partial detachment.

Case 169. J. F. C. Aged 28. R. v. = 6/60. L. v. = p. l.

This man was wounded in the face by a trench-mortar bomb. The right eye exhibited a broad and long crescentic rupture of the choroid on the *inner* side of the disc and close to it. All the inner sector of the fundus was seamed with patches of atrophy, and there was much coarse proliferation of pigment. In the left eye there were similar severe concussion changes scattered about the macular area, which was greatly disorganised. No other lesions were present in either eye.

Case 171. R. C. Aged 39. R. v. = 6/60. c Sph. — 20D. L. v. = p. l.

In this case the issue is rather confused, because the man previous to wounding was suffering from very defective sight due to extreme myopia. He gave a history that the sight of the left eye was lost quite suddenly following upon concussion due to a shell-burst close at hand, the vision of the right eye being injured at the same time, but not so badly as the left. Both eyes exhibited very severe central changes, some of which were certainly due to the myopia, but in part differed from those usually seen as the result of this disease, in that there was a great deal of pigment proliferation, the latter being probably due to concussion.

Case 172. A. C. Aged 24. R. eye removed. L. v. = 6/60.

This man's nose and both upper jaws were smashed by a shell splinter. The left eye exhibited multiple delicate choroidal ruptures and pigmentary changes about the disc and macula. There were no other signs of any injury. The right eye was destroyed at the time of the wound and removed shortly afterwards.

Case 178. R. D. Aged 31. R. v. = p. l. (eccentric). L. eye removed.

In this case the left temple was perforated by a fragment of shell and the left eye destroyed. The right eye was not visibly injured. Examination of the left fundus showed that there had been acute swelling of the disc, whilst the whole of the central region was much mottled with masses of pigment and plaques of retino-choroidal atrophy. There was also a long, narrow, vertical, choroidal rupture close to the outer margin of the disc. Probably the nerve had been lacerated by a spicule of bone, the globe itself being badly jarred but not wounded.

Case 198. J. F. Aged 21. R. eye blind. L. v. = 6/60.

This patient was buried in a shell explosion. He stated that he noticed that his sight was very bad when he was released. He was invalidated three months later with a diagnosis of disseminated sclerosis and right optic atrophy. Seven months later still, when I saw him, there were no definite signs of organic nerve disease beyond his blindness. The right nerve showed primary atrophy of considerable standing. The left nerve was quite healthy, but in this eye there were fine speckled changes about the macula, which were probably the result of concussion. The cause of the right optic atrophy was not clear, but I think it can be assumed that it had nothing directly to do with the shell explosion.

Case 219. F. H. Aged 31. R. v. = 6/60. L. eye removed.

This man's blindness resulted from a shrapnel wound of the face, by which the left eye was smashed and removed. The right eye exhibited severe concussion changes, not confined, as so often was the case, to the central region of the eye, but scattered all over the fundus. There was a large crescentic rupture of the choroid on the *inner* side of the disc and close to it. There were no other lesions. This case should be compared with Case 169, in which also there was a rupture of the choroid on the inner side of the disc. With the exception of a case described in Chapter VI (Case 13, *vide* page 79) these are the only instances in which I have seen a single rupture of the choroid on the inner side, and I have never come across an example in civil practice. In a few instances of multiple choroidal ruptures, such as Case 172, just described, I have thought that the choroid on both sides of the disc was split in places; but a single internal rupture must be an extremely rare form of injury.

Case 267. H. Mc. D. Aged 25. R. v. = p. l. (eccentric). L. v. = 5/60.

Here blindness was the result of a detonator explosion, and a particular sad feature about it was, that the right eye, which was practically blinded, was the only useful one. The left had always been a defective eye, and when a boy he used to wear a patch over the right to try and improve the left vision. The left eye seemed to have suffered no injury at all, and was quite normal in appearance. The right eye was aphakic and the tension subnormal. The destruction of the vision was due to a large

forward inferior retinal detachment. There was no sign of perforation of the globe, and no foreign body could be discovered, so that the detachment was certainly due to concussion.

Case 305. A. P. R. v. = p. l. (eccentric). L. v. = 3/60 (with lens).

This was a case somewhat similar to the preceding, in that the man was blinded in his only useful eye as the result of a shell exploding close to him. The right eye exhibited severe concussion changes about the disc and macula. The media were clear and there were no signs of perforation by any foreign body. The left eye had not been injured, but it had always been defective and useless. The fundus was quite healthy, but the eye was exceedingly hyperopic, and glasses seemed to be of little use.

Case 307. A. R. Aged 25. R. v. = 2/60. L. eye blind.

This was a case of shrapnel wounds of the face, with no apparent direct injury to the eyes. The right exhibited severe concussion changes about the macula and over a large surrounding area. The disc was of good colour. The left disc was extremely pale, and there were similar severe pigmentary and atrophic changes as in the right, except that in this eye the fundus changes were situated to the inner side of the disc. The media were quite clear in both eyes, and there were no signs of any foreign body.

Case 350. A. V. Aged 34. R. v. = 1/60 (with Sph. - 12D). L. v. = 5/36 (with Sph. - 11D).

A shell burst within a yard or two of the man, knocking him down, but not actually wounding him. The patient, who was very myopic, stated that he was practically blinded at once. No fundus details could be made out on account of the murky condition of the vitreous, which in each eye showed many stringy opacities. No detachment of the retina could be seen, and there were no signs of iritis or other form of anterior injury or inflammation. Probably the concussion resulted in a severe intra-ocular haemorrhage.

Case 355. C. W. Aged 24. R. eye removed. L. v. = 1/60.

In this case a shell splinter smashed the right eye. The left eye exhibited severe concussion changes round the macula and neighbouring part of the fundus, which had

practically destroyed the sight. The media were quite clear, and there was no sign of any perforation of the globe.

Case 394. C. M. Aged 22. R. eye removed. L. eye removed.

This was one of the most extraordinary cases of the War. The wound occurred at Gallipoli, and I have not been able to obtain any history as to what exactly happened; but the patient is an extremely intelligent man, and he gave a very clear account of his own impressions.

He was standing near the edge of a cliff, when a shell burst quite close in front of him, and he was knocked down and rendered unconscious for a time. He stated positively that he was not wounded directly by the shell. Both eyes were, however, destroyed and removed very soon afterwards. There was corroborative evidence of his statement in the fact that he showed no sign of any scar in any part of his face or about the eye-sockets; and what apparently happened was that his eyes were blown in and smashed by the direct force of the concussion. There seemed no reason to doubt the story, though it was such an extraordinary one, and I have seen no other case comparable with this. Unless I had known the man well and had had the opportunity of closely examining him, I should have much doubted the possibility of the eyes being smashed by the direct effect of concussion; because it is extremely difficult to conceive a smashing blow on the eyes which would leave no sign of injury to the parts immediately surrounding, such as the eyelids. And yet this very fact tends to support his statement, because any shell fragments which would have pierced the globes must have left some scars in the immediate neighbourhood.

I may add that this patient had a great dislike to the idea of wearing artificial eyes, so that at his request, I re-sected the whole of the conjunctival sac on each side and permanently closed the lids with sutures. The sacs were absolutely healthy, and the orbital contents free of any foreign bodies or cicatrices. I performed this operation on a good many other cases when the orbits were so injured that an artificial eye could not be worn.

(d) MISCELLANEOUS CASES OF SPECIAL INTEREST

All the remaining cases, 289 in number, were blinded by direct smashing injuries from in front, or by perforation of the globes by fragments of metal or other foreign bodies.

A small class embraces accidents which were preventable,

i. e., accidents which should not have occurred if proper care had been exercised. Ten cases of blindness resulted from explosions in munition factories, and in eight cases the eyes were destroyed from the premature bursting of blasting charges. Three more were blinded as the result of booby-trap explosions.

Most of the cases in this miscellaneous group need no special description, but the histories of a few very interesting ones are appended.

Selected Cases

In five instances the eyes were blinded as the result of premature explosion of bombs.

In one case both eyes were destroyed, and the right hand was amputated. In two other cases both hands were blown off as well as both eyes destroyed. In the fourth, both eyes were quite destroyed. The fifth was a sad case which has been mentioned under Concussion Blindness. The explosion destroyed his only useful eye, leaving the other eye, which had been defective since birth, untouched.

One man was blinded in an extraordinary way. For several months he had used a detonator as a pencil-case, thinking it was empty. One day, when ramming a pencil into it with extra force, it exploded, destroying both his eyes.

Another curious case was one where blindness was due to injury by the sharp end of a 16-inch file, which flew out of its handle when the man was using it as a cricket bat. The file perforated the left eye and smashed its way through the inner walls of both orbits. The left eye had to be removed at once, but the right was retained, though quite blind. The eye was almost fixed in mid-line, and evidently much injury had been done to all the structures behind the globe. Nothing was to be seen in the fundus beyond a pale atrophic disc.

The nature of one of the three booby-trap cases is worth recording, because it is somewhat unusual and distinctly ingenious. A man, with a section of his company, took possession of a room evacuated by the enemy two days before the armistice. A fire was required, and the man was directed by his sergeant to utilise some wood which was lying in a corner. The man picked up a billet and started to chop it up for firewood, when it promptly

exploded and completely destroyed his sight. It seems that the billet had been hollowed out and an egg-bomb placed inside.

Two cases of blindness (Cases 20 and 243) were the results of bayonet wounds. They are the only two cases in my list in which blindness was due to this cause, and they are both worth recording.

In one case the man received a severe bayonet wound under his chin. Both upper jaws were fractured by the bayonet, and when he recovered consciousness he found that he was practically blind. Both eyes showed that there had been very severe neuro-retinitis. The discs were blurred and pale, with a good deal of definite retino-choroidal atrophy, most marked about the macula. Probably the point of the bayonet pierced the orbital floors and grazed the eyes and nerves. The man could still count fingers held close to his eyes, but nothing beyond this.

The other case was still more curious. The man suffered from extreme myopia, amounting to over 20 degrees in each eye, and probably this extreme short-sight was partly responsible for the accident by which the left eye was accidentally pricked by the bayonet of a comrade and blinded. The eye itself exhibited no injury at all from in front; but deep examination showed that the lens had been dislocated upwards, and the lower edge tilted backwards, the tension of the eye being considerably hyper-normal. The fundus could be seen quite well, the vitreous being quite clear, and it exhibited an extraordinary and deep crateriform cupping of the disc, strongly suggestive of rupture of the lamina cribrosa. What I think must have happened was that the bayonet caught the lower portion of the eye, and that the eye was violently rotated backwards and upwards in front of the bayonet, thus causing a partial avulsion of the optic nerve. The eye was completely blinded.

Explosive bullets were said to have been the cause of blindness in two cases (Cases 50 and 92).

In one of them the bullet perforated the rim of the steel cap and struck the bridge of the nose, which was smashed. Both eyes were perforated by splashes of lead, and a foreign body was still lodged in each eye. The patient still retained a very slight amount of vision in both eyes.

The other case was precisely similar, in that the bullet pulped the bridge of the nose and blinded both eyes. The

right one was removed shortly after being wounded, and the left eye, which still retained a slight perception of light, showed a foreign body in the globe.

Aeroplane accidents accounted for two cases (Cases 113 and 405).

In one (Case 113) the patient, aged 19, collided with another aeroplane when taxi-ing across the aerodrome. He experienced a severe crashing blow on the upper part of his face, which smashed and flattened the nose. The eyes presented no sign of external injury, but on examination there was seen to be bi-lateral rupture of the choroid, appearing in each eye as a broad crescent close to the upper margin of the disc, which was very pale. In the right rupture there was a starry-shaped white plaque running from the centre of the rupture to the centre of the disc, probably haemorrhagic in origin. In the left eye there was a retinal rent at the macula, the retina being detached over a considerable area all round the hole.

The second case of aeroplane accident (Case 405) was without doubt the worst case of mutilation that I saw in the whole course of the war. The patient was a pilot whose aeroplane was shot down, and when it crashed, caught fire. The man was not extricated until he had been horribly burnt all over his face, arms and body. The whole of the skin of his face was practically destroyed, and he was terribly mutilated and disfigured. He first came under my observation after many months of suffering spent in hospital. His face was then one huge scar: the lips practically destroyed, just the stump of the nose left, and the rims of his eyelids dragged away upwards and downwards from the eyes. Very severe corneal ulceration had occurred, practically obliterating the sight of one eye, whilst in the other eye there was a large bulging corneal scar with adherent iris and rather plus tension. This eye still retained sufficient sight for the patient to see about the room and recognise large objects fairly close to him, but it was rapidly going. With much difficulty, I managed to perform a satisfactory iridectomy by which the tension was brought to normal and the bulging of the cornea much reduced. I am glad to say that he retained his remaining sight until the time of his death about a year later, following upon a magnificent attempt to relieve his misery by extensive grafting operations.

A very interesting fundus picture was afforded by another case (Case 114) in which the man was wounded by a

fragment of shell by which the right eye was smashed and had to be removed. The left eye still retained a little vision, and the fundus picture was one of retinitis proliferans of a severe character. From the upper periphery of the fundus, close to the ora serrata, a feathery finger-like white mass passed back across the vitreous chamber to the retina a little above the disc, clawing away the upper segment of the retina, which hung as a grey film over the upper pupillary space. Another similar finger, near the same point of origin, drew away the retina over the lower and inner sector. Both fingers were permeated by new blood-vessels, and at their distal ends expanded mushroom-wise, this expansion, in the case of the upper finger, being covered with a brush of new vessels.

Blindness in four cases (Cases 185, 209, 344, 407) was the result of burns by chemicals.

In one of them the man was pouring molten aluminium into a cold tube, with the result that the metal splashed up into both eyes and completely blinded him, both eyes having to be removed.

In two others the man was blinded by lime burns. There was very severe scarring of the eyes and shrinkage of the conjunctiva, by which the eyes were quite destroyed visually.

The fourth gave a very curious history. The patient was sitting near a stove with a bottle of a solution of silver nitrate in his pocket. After a time he took the bottle out of his pocket, upon which the stopper flew out and the contents of the bottle splashed into both his eyes. Both eyes were destroyed and the face badly disfigured by scars. The right eye was a shrivelled stump, and in the left eye the cornea was completely opaque with abundant superficial pannus. He still retained perception of light in this eye, but the cornea was beginning to give way, and complete blindness was only a matter of time.

Case 186 presented an extremely curious ophthalmoscopic picture. The eyes were wounded by an explosion of an egg-bomb, the right being smashed and removed shortly after being injured. The left eye retained a slight perception of light above the horizontal line, but nowhere else. Examination of this eye showed that the lens had been dislocated backwards and was lying vertically in the vitreous chamber supported as it were by the retina which, detached from the ora serrata above, had fallen on to the lens and partially enveloped it. The clear fundus reflex could be seen over the top of the

detached retina. The case came under my observation four months after the wound, and the lens transparency had up to that time been maintained, but four months later I noted that the lens had become opaque. It was then lying on its face at the bottom of the vitreous chamber, more or less enveloped in detached retina as before. The retina which was lying behind the lens, could at the time of my first note be plainly seen through the lens, and appeared much thickened and of a yellowish colour. I also then noted some new blood-vessels and some pigment proliferation. No view could be obtained of the condition of matters at the posterior pole of the eye.

Cases 190, 193, 203 and 271 were four interesting cases in which one eye was directly injured and the other blinded only by indirect injury.

In Case 190 a shell splinter struck the left forehead and eye, completely blinding the latter, which was removed. The right vision failed very shortly after he was wounded. There was an intensely white disc, with a slightly filled-in cup but normal vessels. No other lesions were present. It seemed probable that the blindness of this eye was due to a fracture of the right inner orbital wall and consequent injury to the optic nerve.

In Case 193 a piece of shrapnel smashed the left eye, which was much disorganized and converged strongly, being bound by adhesions to the inner orbital wall. The right disc exhibited extreme primary atrophy without any other lesions. Probably blindness was due in this case, as in the preceding one, to fracturing of the inner orbital wall and to injury of the nerve by a spicule of bone.

In Case 203 a bullet struck the peak of the steel hat and smashed it, destroying the right eye, which was removed. The left eye exhibited intense optic atrophy, with evidence of a preceding swelling of the disc. The eye was completely blind, and here, again, the cause was probably a fracture of the inner orbital wall with injury of the nerve.

In case 271 a shell splinter struck the bridge of the nose, smashing it badly and destroying the left eye, which was removed. The right eye exhibited an intense primary atrophy of the disc, but no other lesions. The explanation seemed to be precisely similar to the three preceding cases, but the remaining eye in this case was not quite blind, the vision amounting to 1/60.

Cases 233, 293 and 327 possess a tragic interest in that in all these three cases the only good seeing eye

was destroyed. The only one of the three cases that needs any special description is **Case 327.**

The face was struck by a fragment of shell in the angle between the nose and the right inner canthus. The splinter passed backwards and to the left, remaining embedded in the skull; and curiously it was the right eye, close to which the splinter made its entrance, which was entirely uninjured. The left eye exhibited a very atrophic nerve, with no other lesions, and it seemed certain that the atrophy was the result of fracture of the left inner orbital wall, by which the nerve was either directly or indirectly injured. The right eye was extremely hyperopic and astigmatic, and had been very defective since birth. This case might be compared with **Cases 267 and 305** described under Concussion Blindness in which the only good seeing eye was the one which was destroyed (*vide* pages 33, 34).

Case 240 deserves mention because of the very unusual way in which the eyes were destroyed. The accident must have been an extremely rare one, for I have never seen or heard of another case. The man tripped up when trying to force his way through a barbed wire entanglement. Apparently he fell with considerable force and was quite unable to save himself. As a result of his fall the left eye was pierced by the barbed wire and had to be removed. The right eye partially escaped, but the cornea was probably perforated, as a traumatic cataract resulted. With a cataract lens fitted to this eye, the man could just read 6/60, diffuse corneal nebulae preventing a better result.

Cases 264 and 268 are interesting in that they both exhibited a rent in the retina.

In the former case there was a large inferior detachment of the right retina, and at the immediate neighbourhood of the macula there was a hole in the retina limiting a large oval deeply pigmented plaque, of retino-choroidal atrophy, which was spangled with abundant golden and glistening cholesterol crystals. The picture was a very extraordinary one, giving the impression of a piece of black lace covered with gold spangles. The eyes were wounded by a fragment of shell which completely destroyed the left eye, which had been removed. The vision in the remaining right eye just amounted to light perception.

In **Case 268** the eyes had been wounded by a trench-mortar bomb, by which the right eye was completely blinded. This eye showed a pronounced condition of

enophthalmos, though the movements were quite free. There was a rosette fracture of the posterior capsule of the lens; the disc, hazily seen, was very white, and there were some very severe retino-choroidal concussion changes all round the centre of the fundus. In the left eye there was a large rent in the retina close to the macula, and near by could be seen a few sparkling cholesterin crystals.

Another case of hole at the macula (Case 113) has been previously described (vide page 38).

Case 343 is mentioned because it has a very curious history. The right eye was smashed by a shrapnel splinter and removed. The man returned to duty, but a few months later was sent back to England to his old work as a coal miner. A few months after his return to England the remaining left eye was penetrated by a fragment of steel and ultimately lost by inflammation. When he came to St. Dunstan's the left iris was markedly bombé, the pupil completely occluded and excluded, and the eye quite blind.

Case 356 is one of the most interesting of the whole series. The right eye was destroyed by a cartridge explosion seven years before the War, when the man was serving in the R.F.A. This eye was removed. The left vision seems to have been injured by the explosion, but not very badly. Anyhow he left the Army after the removal of the right eye, though he had good enough sight in the left to be accepted for the Artillery in September 1914. He served continuously until December 1915, when, the left vision failing rapidly, he was sent home, and finally invalidated from the Service in the following February.

The history was peculiarly interesting in view of the condition of the left eye. When I saw him shortly afterwards at St. Dunstan's, the disc and the region between it and the macula was straddled by organised white bands of connective tissue, which lay in the posterior layers of the vitreous, and under which there was atrophy of the visual coats. There was also a vertical scar close to the macula which might have been a choroidal rupture. An X-ray skiagram showed that two fragments of metal were embedded in the posterior coats of the eye in the neighbourhood of the above-described changes. The vision of the eye was reduced to bare light-perception.

It is most extraordinary that these foreign bodies should have given rise to so little disturbance of vision for eight years, and should then have caused visual destruction. The

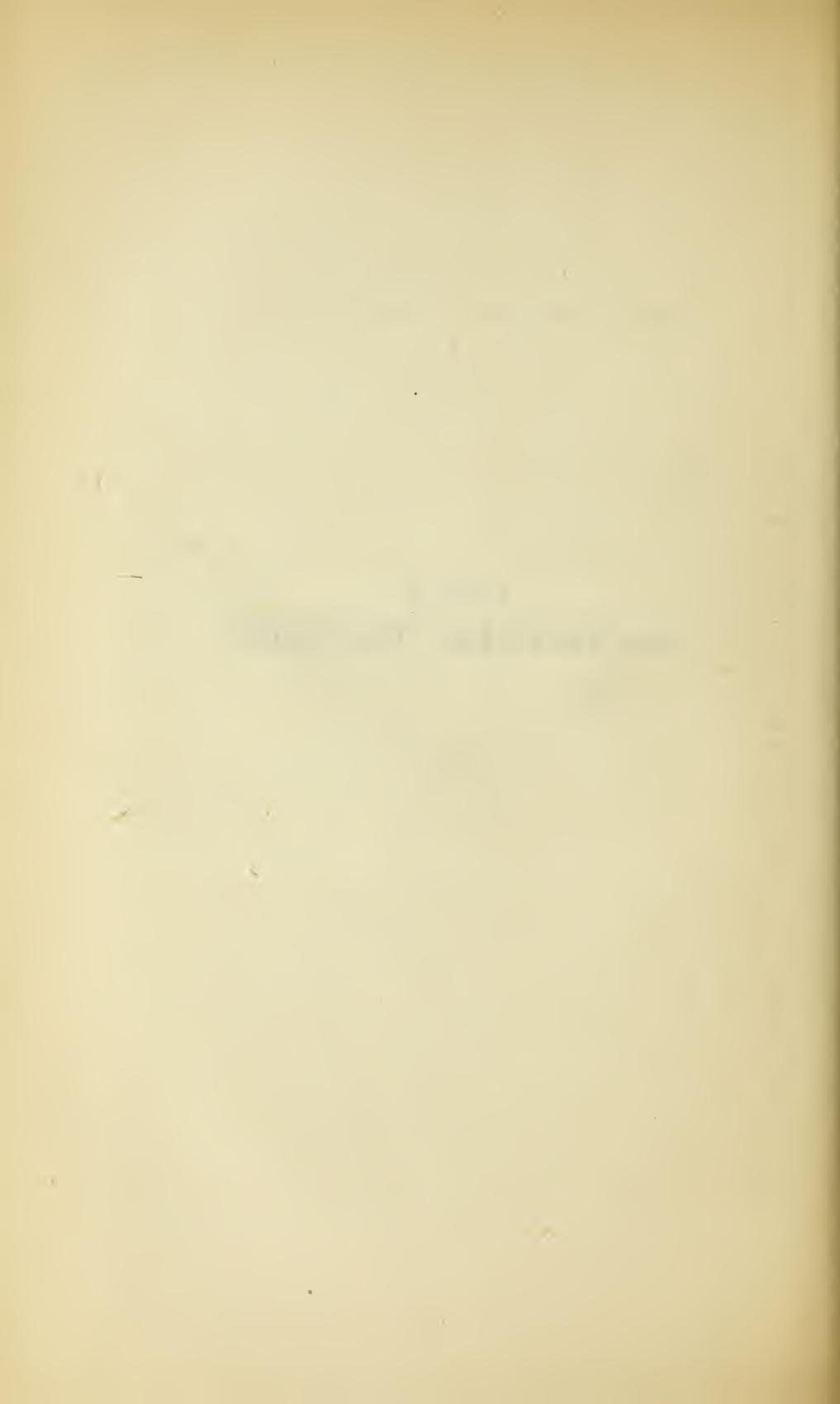
man was never injured in any way subsequent to the accident by which the other eye was destroyed, nor was there any sign of inflammatory disturbance of the eye beyond the changes about the posterior pole. The only explanation can be that for some cause or another the foreign bodies which had become encapsulated, must have shifted slightly and so set up some acute irritation around, and, as they were obviously very close to the macula, it would take very little inflammatory change to cause a great deal of visual loss.

Case 365 is a case possessing some interest. Both eyes were destroyed by shell splinters, but were not removed, and when I saw the man he had two mutilated shrivelled stumps in the orbits. The wound had taken place about eighteen months before, and when he came to me he was suffering a great deal from intermittent headache, and at times much local pain. The interest of the case lies in the condition of these stumps. I strongly advised him to have them enucleated, but when it came to trying to do so it proved to be an extremely difficult matter. It will perhaps be hardly credited, but the eyes were so firmly retracted by dense bands that it was only with extreme difficulty that I could dissect them from the orbits, and the operation took me nearly an hour. All discomfort ceased as soon as the stumps had been removed.

Case 386 was a very unusual form of injury. The man served in the Tank Corps. A bullet flattened itself on the wall of the tank, just in front of his face, and fragments splashed up into his face, blinding both eyes. A skiagram showed multiple minute foreign bodies in both orbits, both eyes, and in the nose. The right eye was quite disorganised and blind, but the left eye still retained a glimmer of light which was not likely to last.

Case 395 is a very interesting one, in that the patient when wounded was found to be suffering from advanced retinitis pigmentosa, and obviously the case should never have been passed for Active Service. Before the war he was acting as a clerk, but had had much difficulty in doing his work for some years. Another point of interest was that the piece of shrapnel, by which the left eye was destroyed, still remained lodged in the left orbit. The other eye was uninjured and retained some useful vision amounting to 6/60, but the disease lesions had progressed close up to the macula, and there was much choroidal atrophy as well. Consequently, as blindness was inevitably his fate in the near future, I admitted him into St. Dunstan's.

PART II
NON-TRAUMATIC BLINDNESS



CHAPTER IV

NON-TRAUMATIC BLINDNESS

NUMBER OF CASES 417

General Remarks

WE now come to cases of disease-blindness. The heads under which they will be discussed have already been mentioned at the end of the introductory chapter, and a perusal of the cases, with which I shall illustrate the different types of disease-blindness, leads to some general reflections with regard to the acceptance of men for active military service.

Firstly, it is not advisable to accept for Active Service any man whose defective sight in *both* eyes is due to old inflammatory disease of the uveal tract. No matter how quiet the eyes may be, or for how long a time the disease has been stationary, old inflammatory mischief is always apt to recrudesce under conditions inimical to general health. I use the word *apt*, because we have not at the present time any sound basis for proving the total elimination of causative factors, nor has the examining surgeon, as a rule, time at his disposal to make an examination on this point.

Secondly, the greatest importance should be paid to the defective sight of *one* eye, however sound the other may be. If it is found that this defective eye has been seriously injured by destructive uveal inflammation, then, even though the loss of sight may have occurred many years before, the candidate should, in my opinion, be refused. If one eye has been affected disastrously by inflammatory disease, the other eye is always, to some extent, liable to attack, and especially would I urge this course when it is shown that the patient is the subject of syphilis, either congenital or acquired, of chronic gonorrhœal urethritis or rheumatism, or of any other form of infection, such as pyorrhœa, which is known to occasion secondary eye

inflammation. Destructive traumatism or uveal inflammation, directly and entirely due to traumatism, is the one and only exception I would make to this rule.

Thirdly, a careful ophthalmoscopic examination of every candidate should always be made by somebody who has real knowledge of the subject. If this had always been done a large number of cases of active congenital disease such as retinitis pigmentosa or other forms of fundus disease, such as chronic choroido-retinitis of various kinds, would have been refused, and the State would have been saved disability pensions amounting at the present time to very many thousands of pounds per annum. On this matter I shall speak more at length in a chapter devoted to pensions; but a casual glance over the cases of non-traumatic blindness will bring out this point forcibly enough, and will pave the way to what I shall say in the succeeding chapter.

Of course, I am well aware that the sudden strain thrown upon the country's resources at the time of the war resulted in attempts to fit any number of square pegs into round holes, and this was so, not only in the domain of medical science, but in every other war department as well. There were not nearly enough men with expert ophthalmoscopic knowledge to go round, and further, the need of men was so urgent that the examining doctors were forced to take what now seem to have been unjustifiable risks.

None the less, the war should teach us these three lessons with regard to eyesight examination, and if they are taken to heart they will at least help to force upon hospitals and medical colleges the absolute necessity of securing a better ophthalmoscopic education for medical students. Recently attention has to some extent been focused upon this point, but the new regulations imposed upon students are quite inadequate, and will not materially improve the situation.

Fourthly, the appalling share which must be allotted to syphilis of the total number of cases of disease-blindness will, I hope, have some little effect in helping to stir up public opinion to force some level-headed jurisdiction on the subject. It is so obvious how to improve matters; but everybody seems afraid of the obvious, and nothing vital is done because the obvious is called a pandering to vice, and is really believed to be so by many quite nice and usually sensible people.

BLINDNESS CAUSED BY INFLAMMATORY DISEASES
OF THE EYE*Number of Cases 138*

1. INTERSTITIAL KERATITIS.
2. OTHER VARIETIES OF INFLAMMATORY DISEASE.

1. Interstitial Keratitis

This variety of inflammatory disease naturally falls into a class of its own. My list contains records of 47 cases blinded by this disease, and the casual perusal of them enforces what has already been said above as to the inadvisability of accepting for Army Service cases of congenital syphilis who exhibit signs of previous interstitial keratitis in one or both eyes. The cases themselves bring out many interesting points.

Undoubtedly there is no age limit to the onset of this disease; although, of course, the primary attack is far more common under than over thirty years of age. Six cases were over 40 years of age, 10 cases occurred between the ages of 30 and 40, and 31 cases were between the ages of 20 and 30. The oldest case was aged 55, and the youngest was aged 20 years.

Unilateral interstitial keratitis is rather exceptional; but these war cases make it clear that not only is a one-sided inflammation more common than one had supposed, but that the attack on one eye may be followed many years later by a second unilateral inflammation affecting the other eye. A second attack in the same eye or a recurrence in both eyes is, of course, fairly common.

All the cases in the list were probably due to syphilis, either congenital or acquired. It was positively present in 27 cases, and clinically typical in 13 more, making a total of 40 out of 47, for which this disease was primarily responsible. In the remaining 7 cases there was a doubt as to whether the blindness was not due to inflammation following some form of traumatism, the resulting clinical signs being indistinguishable from those one usually associates with interstitial keratitis, due to syphilis.

Tubercle was not recognised in any case. Fundus trouble was probably present in a fair proportion of cases,

but owing to corneal conditions deep examination of the eye was not often possible.

In 30 of the cases the primary attack occurred after the man had joined the Army, but in 10 of these the inflammation started before the man went abroad on Active Service, and when he was training at home. In 9 cases there was a clear history of previous inflammation when the man was accepted for Active Service, and the blindness was due to recrudescence of the disease.

In all of these 39 cases, the conditions of Army Service in time of war, whether at home or abroad, but especially when abroad, had probably a great deal to do with the onset or recrudescence of the disease. In civil practice one knows very well how much the general health of the patient counts; for the disease is much more common amongst debilitated poor children than amongst those of the well-to-do classes. Also, it is almost invariable for the patient to give a history of exposure to cold or wet, or to a slight local injury, such as the flying into the eye of a particle of grit, as the first reason for the attack.

Adverse conditions are, of course, encountered on Active Service, at home as well as abroad, and probably most of the boys when joining the Army experienced for the first time in their lives what hardships meant. The Pension Authorities were in the habit of saying that the conditions of Home Service were not compatible with the idea of privation or hardships, a line of argument which always seemed to me absurd, because the question is a comparative one, depending upon the person's previous life. The conditions may not have seemed severe or hard to a very large number, because in their previous life they had been accustomed to much of the same sort of thing; but to very many others Army Service meant a complete change in their manner of life, and when the boy happened to be affected with congenital syphilis, he probably was not in a condition of health to withstand any extra call upon his strength and vitality.

I think it is only fair to assume that in a large proportion of these cases, interstitial keratitis would never have occurred if the patients had not served in the Army, especially as one notes that so many of these youngsters had already grown to manhood without ever having experienced any trouble with their eyes. Of course, at St. Dunstan's one only saw those cases in whom the disease had run on to destruction of the eyes, and probably

a very large majority of the war cases of interstitial keratitis recovered sufficient sight to enable them to earn their own living. Certainly under suitable treatment the disease does not usually destroy, though as a rule it permanently mars the sight, and I am inclined to think that 47 cases of blindness represent a much higher rate of destruction than one is accustomed to see in civil practice.

A number of these cases came to St. Dunstan's with active disease still obvious. Many of them I took into hospital for in-patient treatment, and in some cases for operations as well. In eight cases I performed an iridectomy; in four of them on both eyes, and in each case the operation produced a decided beneficial effect in the nutrition of the eye, and in some cases there was also a distinct improvement in the sight.

The following six cases present some special features which are worthy of record :—

Case 4. This man had suffered from night-blindness since he was a child, and he had also had a bad bout of inflammation in both eyes some years before he joined the Army. The cornea showed central haziness, and there were evidences of some old deep pannus. The fundus could be hazily made out and exhibited a diffuse retino-choroidal atrophy, mottled with pigment. The discs were pale and blurred, and the arteries thready.

The condition was obviously one that had existed, to some extent, for very many years, and the man would never have been accepted for Army Service if he had been properly examined. The history shows that he became rapidly worse soon after he joined the Army. The probability is, that had he been rejected he would have maintained his sight for many years, though doubtless he was ultimately doomed to blindness.

Case 6. This case is interesting because the man had never experienced any trouble with his eyes until he was 30 years of age, when he had an attack of interstitial keratitis in one eye only, which practically blinded it. The other eye was attacked for the first time when he had been in the Army for nine months, and the inflammation proceeded to blindness in this eye as well. Here, again, only one eye was attacked, the eye first blinded remaining quiescent.

Case 15. The left eye was blinded in early childhood from a severe attack of interstitial keratitis, but the other eye remained quiescent, and was so when he joined

the Army at about 30 years of age. He was a subject of typical congenital syphilis. The case is interesting because of the unilateral character of the first attack, and the length of time, at least 20 years, between the first and second attack.

Case 24. I record this case because once more it enforces the necessity of efficient examination. How under any conceivable circumstances this man could have got into the Army I cannot understand, but I will leave the facts to speak for themselves.

The man was trained at the Leatherhead School for the Blind for six years, and was then taken over by the Association for the Blind as a brush-maker, and worked thus for seven more years. Thence he was transferred to the Waterloo Road Institution, and was working there when he was actually accepted for the Army and graded C 2. He was then aged 29 years. The right eye was quite blind, and had been so since babyhood. It had suffered from intense uveal inflammation, and was in a condition of phthisis bulbi. The left eye had also been defective since early boyhood. The cornea was very hazy and no details of the fundus were obtainable. With a high myopic lens he succeeded in reading 5/60 with the left eye, but only with difficulty.

Case 28. This was an interesting case because it was one in which the patient suffered from severe spring catarrh, as well as interstitial keratitis. Both eyes exhibited the effects of an extremely severe attack of interstitial keratitis, as a result of which both corneaæ had perforated, leaving the right cornea very staphylomatous. In the left eye the perforation had been still more extensive, and the eye was shrunken and blind. Both upper tarsi were extremely affected with spring catarrh, which had never been treated, and obviously the condition never recognised. The Wassermann reaction was positive. I treated the upper lids with radium, and cured the spring catarrh fairly easily.

Case 41. I record this case, because this and the preceding one were the only two of the list in which both corneaæ had perforated. The man's age was 24, and the inflammation came on when he was on Active Service abroad. He had never previously had any trouble with his eyes. The attack of inflammation in one eye preceded that in the other by about two months. Each eye exhibited a large bulging staphyloma of the cornea, and the eyes were visually destroyed.

2. Other Varieties of Inflammation

Apart from Interstitial Keratitis, destructive inflammatory disease was the cause of blindness in 91 more cases. In the vast majority of these the cause was uveal disease. In 41 cases the blindness was the result of an irido-cyclitis, which in several instances passed back to involve the choroid and neighbouring parts, whilst in 38 the inflammatory changes were confined to the posterior portion of the uveal tract, leaving the ciliary body and iris unaffected.

Three cases, all of which I am recording, were the result of metastatic uveal inflammation, two of which proceeded to a panophthalmitis. In three other cases the uveal inflammation followed upon cerebro-spinal meningitis, whilst in four others the inflammation was due to sympathetic ophthalmitis.

In all, destructive uveal inflammation was the cause of blindness in 79 out of the total of 91 cases, blindness in three more being due to haemorrhagic retinitis associated with nephritis, whilst the remaining 9 cases were the result of corneal ulceration.

Syphilis was the proved cause in 21 cases, whilst in 18 more it was the probable cause, making a total of 38 cases which can be ascribed to this disease. This is probably very much understating the case. I think the very large majority of the cases of destructive uveitis, and especially those cases where the inflammation was general, that is involving the whole uveal tract, were due to syphilis. No doubt a few were due to gonorrhoea, but I saw no case in which I could be positive of this, and in my experience blindness in both eyes as the result of this cause is rare, whereas, of course, it is quite common in syphilis.

One case distinctly seemed to be due to pyorrhœa, whilst in two more cases the inflammation supervened during the course of septic inflammation of other parts of the body.

The following cases possess some special interest :—

Cases 4 and 55 are two typical illustrations of the difficulties which may arise in distinguishing old Specific Disease from Retinitis Pigmentosa.

In Case 4 the man was aged 32. He had suffered from a defective left eye since early boyhood, but considered

that the right vision was good when he joined the Army. The sight in both began to deteriorate rapidly whilst he was on Active Service in France. Both eyes exhibited universal and severe retino-choroidal atrophy, with scanty diffuse pigment proliferation of irregular shape and largely choroidal in origin. The discs were waxy and blurry, and the arteries very minute and pale. The Wassermann reaction was negative. The condition was undoubtedly primarily of vascular origin, and, although the Wassermann test was negative, was much more probably due to specific disease than to any other cause.

In Case 55 the man was aged 37. He denied that there was any defect in his sight before he joined the Army, but said that it failed rapidly whilst he was still engaged on Home Service. He was discharged from the Army on account of failing sight after eighteen months' service. The Wassermann reaction was positive. The fundus picture was extremely similar to that usually associated with advanced retinitis pigmentosa, and it was quite impossible to believe that such atrophic disorganisation could have ensued in eighteen months. I regarded it in all probability as a case of specific vascular disease, though, of course, it is quite conceivable that he was really suffering from a congenital retinitis pigmentosa, and that syphilis was an added complication. I do not see how it is possible in a case like this to know which was the primary agent in causing the trouble. The patient's history of good sight when he joined the Army, must, in either case, have been quite inaccurate.

Cases 6, 22, 41, 77, 79 and 89 illustrate the folly of accepting for the Army cases of severe old-standing inflammatory disease and the disaster that is apt to follow for the patient.

Case 6 was a lad of 20, in which the vision of the right and left eyes was a bare p.l. The eyes exhibited the effects of old irido-cyclitis, with diffuse retino-choroidal atrophy and post-neuritic atrophy of the discs. He was trained at a Blind School from 13 to 18 years of age, and he stated that his sight had always been defective. In spite of his history he was accepted for the Army, but had to be discharged in three months because his sight rapidly grew worse. His record showed that he could see 6/24 when he joined the Army. It is probable that he was suffering from congenital specific disease.

Cases 22, 41, 77, 79 and 89 were all cases in which the

eyes exhibited the results of severe Ophthalmia Neonatorum.

In Case 22 the man was aged 29, and both corneæ had perforated, and there was a large adherent leukoma and also anterior polar cataracts and nystagmus. I have no record of his sight when he joined the Army, but he must have been totally unfit for service. He was invalidated on account of increasing failure of sight after about two months.

In Case 41 the man was aged 23. The right eye was quite blind and glaucomatous. The left eye could count fingers at short range. There was an anterior polar cataract in each, and the eyes were nystagmic. He was accepted for service in the Army Labour Corps, but had very shortly to be discharged on account of increasing failure of vision.

Case 77 was very much the same as the two previous. The man was aged 42, and his vision in both eyes was a bare p. l. He served in the Home Army for six months, and was then invalidated on account of rapid failure of sight. Both eyes exhibited central corneal nebulae and anterior polar cataracts, together with nystagmus. The fundi could only be seen with difficulty, but scattered plaques of old retino-choroidal atrophy were visible and the discs were pale and atrophic. The Wassermann reaction was negative, but probably congenital syphilis was as much the cause of his blindness as the ophthalmia.

Case 79 was a man of 26, in whom the vision in both eyes amounted to the counting of fingers at short range. He gave a history that his sight had always been so bad that he was unable to attend school. He apparently never went to any Blind Institution. Both eyes were nystagmic and exhibited central corneal nebulae and anterior polar cataracts. He was accepted for the Army Service Corps and stated that after a bad fall from a horse his vision failed very rapidly, and he had to be discharged. No fundus examination was possible.

Case 89. The patient was a lad aged 20. The right eye was removed when a baby aged two months. The left eye was nystagmic with a central corneal nebula and an anterior polar cataract. He was educated at a Blind School, and had never had sufficient sight to read ordinary print. His vision when he came to me was 3/60, which he saw with difficulty with a high minus lens.

It is incredible that this boy could have been accepted for any form of Army Service, but such was the case. He was called up in the usual way, graded C 2, and retained in the Army for five months before being discharged as unfit on account of defective sight.

Cases 14, 52 and 62 were three cases of Metastatic Inflammation.

Case 14 was that of a man aged 45, who was completely blind in both eyes, and who gave a curious history. A wound in the scalp was followed by severe suppuration and metastatic abscesses in both legs and back. Whilst he was still very ill both eyes were affected by very severe inflammation, by which the sight was completely destroyed. Both eyes were shrunken and disorganised, exhibiting from in front a total posterior synechia, and secondary cataracts.

In Case 52 the man, aged 42, had also been completely blinded in both eyes. He gave a history of acute inflammation supervening in both eyes during the time he was in hospital undergoing treatment for a septic wound of the knee. The right eye was shrunken and entirely disorganised. The left eye exhibited the effects of severe irido-cyclitis, and a grey mass of exudate could be distinguished in the left vitreous chamber.

Case 62 was that of a man aged 31. The right vision was p. l. and the left 6/60 (some). He had never had any trouble with his eyes before joining the Army. Inflammation supervened when he was on Active Service and was evidently of a most destructive character. The Wassermann reaction was negative. His medical record ascribed the inflammation to pyorrhœa. The right eye was practically destroyed, and was glaucomatous. The left was in much better condition, but presented a great deal of old pigmented keratitis punctata and some capsular haze of the lens. The fundus could be seen faintly, and no gross lesions were noted.

Cases 19, 20 and 84 possess some special interest in regard to the possible causation of the inflammation.

Case 19 was one of neuro-retinitis following dysentery. The man was aged 32, and his right vision was reduced to p. l. and the left to 6/60 (eccentric). He gave a history of being very ill from this disease when on Active Service, and during convalescence the right eyesight suddenly failed, and some months later the left followed suit in a similar manner. Examination showed severe retino-choroidal lesions about the maculæ, together with peripheral plaques of atrophy dotted here and there. The discs were very white and blurry, and the arteries thready, indicative of inflammation in the past.

Case 20 was a man aged 47, who gave a history of sight beginning to fail after a severe bout of malaria contracted

at Salonica. His vision amounted to R. v. = 1/60, L. v. = 5/60. He stated that he had had repeated bouts of this disease, and that the sight seemed progressively to get worse after each attack. The fundi exhibited the results of an intense retino-choroiditis, there being extreme scarring and atrophy of the visual coats, with pale atrophic discs.

In Case 84, like the preceding, the loss of sight was attributed to malaria. He was a man aged 47, with R. v. = 1/60, L. v. = 5/60. He served in the Army at Salonica for two and a half years, and had nine bouts of malaria. He stated, as in the previous case, that his sight began to fail immediately after the first attack and progressively got worse with each fresh bout. The central area of both fundi exhibited intense retino-choroidal atrophy, and in the lower segment of the right fundus there was a large flocculent white mass of doubtful nature, which may possibly have been haemorrhagic in origin. The peripheral parts of both fundi seemed quite healthy. The discs were pale.

Cases 23, 25, 30 and 35 are all four of them cases of Specific Disseminated Retino-Choroiditis, and illustrate the necessity, above pointed out, of ophthalmoscopic examination prior to acceptance for Army Service.

The result in each case was that the man, who had attained to manhood for many years, and was still able to earn his living when passed for Army Service, was in a few months reduced to blindness. I append a very short account of each one, as the histories are instructive.

Case 23 was a man aged 35, and his sight was reduced to p. l. in both eyes. He gave a history of both eyes being defective since childhood, but he had earned his own living since a boy, and when he joined the Army he could see fairly well with the left. After six months' service he had to be discharged on account of progressive failure of sight. Both eyes exhibited typical, intense, and diffuse atrophy of the visual coats, and both lenses were becoming cataractous. The Wassermann reaction was positive.

In Case 25 the man was aged 43, and his vision was reduced to the counting of fingers at short range in the right eye, and to p. l. in the left. He gave a history of defective eyesight since a lad of sixteen years of age; but it was considered good enough for the Army, and, in fact, he served for four years in the Army, with two years in France. He states that the sight progressively deteriorated during the whole of his service, and finally this trouble necessitated his being discharged. Both

fundí exhibited a typical picture of disseminated retino-choroiditis of the specific type, and were riddled with conglomerate and discrete pigment-bordered scars.

Case 30. This man was aged 23, and the right vision was reduced to p. l. and the left to 4/60. So far as he could remember he had always had defective sight. One brother had been blind since two years of age, and he also had two sisters with very bad vision. He was accepted for Home Service, and discharged after eighteen months on account of sight failure. He had typical Hutchinson teeth, and both fundí exhibited severe disorganisation, being studded with gummatous scars.

Case 35 was a lad of 20 years in whom the vision of both eyes was reduced to p. l. He gave a history of the left eye being defective since early childhood, but when he joined the Army the right vision was very fair, amounting to 6/9. He was accepted for Home Service, but had to be discharged nineteen months after joining the Army on account of progressive failure of sight. The Wassermann reaction was positive, and both fundí were riddled with typical pigment-bordered scars. The arteries were thready and the discs pale and waxy.

Cases 37, 51 and 67 illustrate the disastrous effects of uveal inflammation, when it occurs as a complication of Cerebro-Spinal Meningitis.

Case 37 was that of a lad of 18 years in whom both eyes were completely blinded. The inflammation supervened during the attack of meningitis, and speedily assumed the character of a panophthalmitis. Both eyes were very soft and rapidly shrinking, and a dark grey mass of exudate completely obliterated the fundus reflex in both.

In Case 51 the patient was a lad of only 16 years of age. He was a boy in the Navy. The inflammation in the eyes commenced while he was still acutely ill from meningitis. Although only three months had elapsed since the commencement of the inflammation, both eyes were already in a state of phthisis bulbi, very soft, and quite blind.

In Case 67, which was that of a man aged 25, the history was much the same as in the two preceding cases. The inflammation had assumed the form of a panophthalmitis. The man still retained p. l. in both eyes, but this slight amount of sight was not likely to last long, as the eyes were very soft and shrinking.

Cases 26, 39 and 40 are interesting illustrations of blindness following Corneal Ulceration.

Case 26. In this case the man, aged 33, had suffered

with recurrent ulceration in both eyes for several years. It had been necessary to remove the right eye about five years before I saw him. The left eye, in which the vision was reduced to the counting of fingers at short range, was affected by a typical Mooren's ulcer. The cornea was very hazy and pale, exhibiting a superficial infiltrate with many staining points and a moderate superficial pannus. With his history he should, of course, have been rejected for Army Service, and he had finally to be discharged because of the recurrence of the corneal trouble. I took this man into hospital and eventually succeeded in completely arresting the ulcer, but a few months later the cornea broke down once again, and I am afraid the ultimate result will be practical blindness.

Case 39 was a specially tragic one, occurring in a man aged 23. He lost the right eye and a leg as the result of wounding. He ultimately returned to duty, but some months later an acute ulceration of the left cornea followed an abrasion from some small foreign body, with the result that he was left with a sharply defined and extremely dense central nebula, which has practically incapacitated him.

Case 40 had a very unusual history. The man, aged 28, was badly gassed in both eyes, and this was followed by extremely severe ulcerative keratitis, with the result that both corneas perforated, and the man was completely blinded. When I saw him, the cornea of each eye was staphylomatous, and there was a large dense and vascular "leukoma adherens." The tension was high, and evidently the complete blinding of the eyes was due to secondary glaucoma. *This was the only case of destructive corneal ulceration, following gassing, that came under my observation during the whole war.*

Cases 13, 46, 81 and 88 are illustrations of Sympathetic Ophthalmitis.

Case 13 was that of a man aged 43. The left eye was badly injured by a blow from a rifle butt. No details of the injury were available, but the eye was removed seven months later. Inflammation of the right eye supervened soon after removal of the left, and had been practically continuous ever since. Two years had elapsed since the affection of the right eye commenced, and the vision was reduced to p.l. An upward iridectomy had been performed. The tension was plus and the pupil was completely bound down, and there was a dense vitreous haze which prevented any examination of the fundus.

Case 46. This man, aged 26, ruptured the right eye by

an injury in a motor-car collision. The eye was not removed for seven weeks, and until sympathetic inflammation had already started in the other eye. The left eye still retained p. l., but was in a state of almost complete disorganisation.

Case 81. The patient was a man aged 32. The right globe had been struck by a piece of porcelain insulator and ruptured. The eye was removed a fortnight later. Two or three weeks after removal of the right eye sympathetic inflammation of the left supervened, and the sight was gradually destroyed, the patient being quite blind at the time I saw him. Sections of the right eye exhibited small areas of uveal tissue incarcerated in the ruptured sclerotic coat. These areas showed groups of lymphocytes and epithelioid cells, but no giant cells. The clinical condition of the left eye was such as one usually associates with destructive inflammation of the sympathetic type.

Case 88. Here the patient, aged 31, developed a traumatic cataract in the right eye, the cause of which was not plain. The cataract was treated in France about six weeks after the injury. The operation was followed by severe inflammatory trouble. Some weeks after the operation inflammation set in in the left eye, and the right eye was removed, though still retaining a little sight. The inflammation in the left eye still progressed in spite of the right eye being removed, and when the man came to me the eye was in a condition of phthisis bulbi, and quite blind. About twelve months had then elapsed since the commencement of sympathetic inflammation. The case raises once more the question of the advisability of removing the exciting eye, if still retaining sight, after definite onset of sympathetic inflammation in the other.

Case 56 is one of general interest in which the blinding was probably due to severe intra-ocular haemorrhage, occurring in eyes affected by extreme vascular disease. Both eyes still retained perception of light, but the vision was entirely eccentric. The man was a myope of moderate degree. He gave a definite history of sudden loss of sight occurring first in the right eye, and nine days later in the left. He stated that the sight was practically destroyed at once, and that there had never been any improvement in either eye. Examination showed both macular areas to be functionally destroyed, being entirely covered by white scars, very suggestive of old haemorrhage. The retinal arteries were extremely sclerosed and the discs pale. The peripheral portions of the fundi were healthy. The man could give no history of any wound or sickness or

cause for his loss of sight. The primary factor, no doubt, was vascular disease, probably specific in origin. The moderate myopia, which amounted to -4D in the right and -6D in the left, could not have been the cause of the central changes at the macula, but it may have favoured haemorrhage in this situation, and probably did so.

Case 66 is interesting because it was the only case of Choroidal Tubercle that came under my observation. A solitary choroidal tubercle is so rare that the case deserves mention on this account alone. It occurred in a man aged 22, who was the subject of extreme myopia. The left vision had been very defective for many years, and the fundus exhibited intense central choroidal atrophy. The vision in this eye was reduced to the counting of fingers at short range, and glasses made very little difference. The right eye was the one upon which he had depended for a long time, and the sight in it had been failing for about twelve months. The vitreous was very hazy, making fundus examination difficult; but situated near the disc was a rounded, projecting grey mass, which was pushing the retina in front of it, and over which the retinal vessels were coursing. The situation, as well as the appearance, made it practically certain that the condition was due to a solitary tubercular deposit in the choroid. The Wassermann reaction was negative. When I last saw the case, about six months later, he had much improved. He had in the meantime been well looked after, and his general health was good. The vitreous was then very much clearer and the choroidal mass had considerably shrunk in size, exposing a deeply pigmented atrophic plaque. The disc was pale, and the retinal arteries rather thready. The only other condition which could have produced the ophthalmoscopic picture would be a deep choroidal haemorrhage, but the rounded projection was very unlike what one usually associates with haemorrhage, and there could be very little doubt that the diagnosis was correct. I may say that I could find no signs of active tubercle present in the lungs or elsewhere, though it is probable that the eye condition was not the primary one.

Case 70. The interesting point about this case was the history. The man was a stoker in the Merchant Service. When working in the stokehold both eyes were severely injured by a blow-back from the furnace. Very severe and destructive inflammation followed. In one eye the pupil was blocked by exudate and the iris was bombé. In the right eye there was evidence of severe irido-cyclitis.

The vitreous was very murky and the retina almost universally detached. Both eyes were completely blind.

Cases 74, 90 and 91 were instances of very severe Retino-Choroiditis, associated with Nephritis.

Case 74. The man was aged 32. The vision in the right eye was 1/60 and the left eye 5/60. The sight failed in both eyes whilst he was in hospital suffering from trench nephritis, and the fundi showed very severe and general retino-choroidal atrophy. The discs were papery-white, and there had been a considerable amount of swelling in the past, with subsequent atrophy and great shrinkage of the retinal vessels. When I saw him, twelve months had elapsed since he was first attacked with renal inflammation. The vision had steadily decreased and was apparently still doing so. He was still passing much albumin.

Case 90. This patient, aged 25, was invalided from France with acute nephritis. He spent many months in hospital, and his sight became affected whilst there. When he first came to me I had to refuse him admission on account of the poor state of his general health; but some months later, being very much better and practically blind in both eyes, I admitted him; but he relapsed soon afterwards and died a few months later. Both fundi exhibited severe changes round the macula, and retinal haemorrhages of a character one is accustomed to associate with renal disease.

Case 91. The patient, aged 40, developed nephritis when on Active Service, and the sight was very speedily affected. The right fundus exhibited an old haemorrhagic plaque close to the macula, and about it many shining cholesterolin crystals were seen. No fundus details could be seen in the left eye owing to many vitreous webs, which were probably haemorrhagic. He still retained a little sight in both eyes. This patient died suddenly of cerebral haemorrhage ten months after this note was made.

The most interesting point about these three cases is the early onset of albuminuric retinitis, and the intensity and rapidity of its progress.

CHAPTER V

NON-TRAUMATIC BLINDNESS (*continued*)

DISEASES OF THE OPTIC NERVE

1. PRIMARY OPTIC NERVE DEGENERATION.
2. SECONDARY OPTIC NERVE DEGENERATION FOLLOWING SWELLING.

1. Primary Optic Nerve Degeneration.

Number of Cases 109.

CASES of Leber's Atrophy and other forms of central scotomata are not included in this list, but will be found discussed under the heading of Miscellaneous Cases of Blindness, where they seem to be more fitly placed than here.

There is a certain monotonous sameness about these cases of primary optic atrophy, which gives little room for speculation or enquiry, and in some ways they are the least interesting collection, though probably the most tragic.

Sixty-two of the total 109 cases were positively the result of syphilis; whilst 18 more were almost certainly so, making a total of 80 cases, or about 75 per cent. of the whole number, in which this disease must be assumed to have played the leading part. All the 62 cases gave positive Wassermann reactions. It must be borne in mind that at least 25 per cent. of cases of syphilitic nerve disease give a negative Wassermann, and the 18 cases classed as *probable syphilis* were in this category, the clinical history and appearances being such as one associates with syphilitic nerve disease, but the Wassermann reaction being negative.

A number of these syphilitic cases had undergone treatment of varying intensity with one or other of the recognised brands of organic arsenic compounds. I wonder how long this method of treating nerve syphilis will be held in repute. So far as optic atrophy is concerned I have never once seen any case improved by it, but,

the other hand, I have on many occasions noted cases to deteriorate rapidly after a course of injections.

Three cases of primary optic atrophy exhibited very severe chronic endarteritis. They all three occurred in men between 30 and 40 years of age, each of whom was the subject of syphilis, and all three died shortly after my notes were taken—one in a lunatic asylum, one from tabes, and one from meningitis. All three cases are described below.

Thirty-three cases were suffering from tabes, generally in an early stage when they came to St. Dunstan's. One was a case of juvenile tabes, which is described below. The age of these tabetic patients when they first came under my observation is worth recording—

3 cases were between 50 and 60 years of age.

12	"	"	"	40	"	50	"	"
13	"	"	"	30	"	40	"	"
5	"	"	"	20	"	30	"	"

The last-mentioned group was a very pathetic one. The ages of the five lads were 20, 21, 22, 22 and 25 respectively, and all were quite blind, and had been so for a considerable time when I first saw them.

The list contains records of six other cases of primary optic atrophy occurring in men under 30 years of age, of whom the youngest was aged 19, and the oldest 27 years, whilst two were 21 years of age. In five out of the six, syphilis was certainly present, but was probably of the congenital variety. Thus, out of the 109 cases of primary optic atrophy, 11 occurred in men under 30 years of age, of which number 8 were certainly under 25 when the atrophy commenced, and the youngest of them not more than 18.

Primary optic atrophy under 30 is very rare in civil practice, unless it occurs congenitally or in the course of juvenile tabes. I cannot personally call to mind seeing any case of this disease due to acquired syphilis under about 35 years of age, and certainly until the late war I had never come across or heard of a boy with healthy eyes at 18 being blinded from this cause by the time that he was 20; but it certainly happened to two or three of the lads mentioned above. A very large majority of the total number of cases recorded in this list were under 35 years of age, and this age incidence is certainly very striking and suggestive.

One cannot avoid the conclusion that the nerve strain and stress set up by war conditions, combined with physical hardships and discomforts, resulted in a tendency for the specific virus to manifest itself by pathological changes in the nervous system, the most highly organised and differentiated part of the human body, and therefore the part most easily disorganised. That the optic nerves were probably the most frequent site of degenerative changes, may be due to the fact that it is largely owing to vision that these nerve-strains are realised and focussed upon the intelligence, and consequently the optic nerves, which are the channels between sight and intelligence, come to be the sites most vulnerable to degenerative processes.

It was rather striking how often exposure to cold and wet, rather than any other form of hardship, was the primary cause ascribed by the patient for his failing sight. Especially, I think, that was so among the tabetic cases. Exposure is a well-known predisposing cause of this disease, and this point came out very forcibly during the war.

Fifteen cases gave a succinct history of an antecedent head injury of a severe nature, to which they ascribed their blindness. These cases raised some interesting points from a medico-legal view. In all of them the alleged injuries were of a character which conceivably may have initiated nerve changes of a destructive character. Thus, one man was badly concussed five years before, by striking his head on the bottom of a swimming-bath when diving. Another, a seaman, fell into a dry dock, which caused very severe concussion several years previously. Another was struck by a heavy iron block on the face and body, both arms being fractured. Three others had been buried by shell-burst, and two were concussed by dislodged sandbags; another was knocked down by a lorry, and another rendered unconscious for a time by shell concussion. One man was rendered insensible by a blow from some coal, which fell out from a tipper at a height of about 30 feet; another struck his forehead against an iron locker while on board ship, while one man ascribed his blindness to a fall down a hatchway. One man had had two bad concussions owing to falls from his horse, and another had experienced a heavy fall by which he was concussed, and which caused a fracture of his left arm and left leg.

When it came to examination, corroborative evidence of their stories was always lacking, by which I do not

infer that they had not experienced accidents of the nature described, but neither the medical records nor an examination into the clinical condition supported the theory that their blindness was a natural or even a probable result, and consequently these cases have not been placed in the list of those blinded by traumatism. It is only natural for any blinded person to ascribe his loss to a cause which he can appreciate, however remote that cause may be, and what more natural than to exaggerate the importance of a head injury which has been severe enough to render him insensible for a time? One would have been more easily convinced about the importance of these injuries had not all these cases been affected with syphilis, and that is where the trouble came in.

The men well knew the necessity of proving the causal association between their blindness and war conditions for obtaining a full pension, and naturally were insistent on the utmost importance being attached to their history. I have always held that, if a man lost his sight when serving his country, then the question was not one of the man having to prove that it was due to his service, but for the State to disprove it, if any question was raised about the eligibility to pension. On this matter I had many a fight with the Pension Appeal Tribunals, in which, I am glad to say, I generally succeeded in getting a disability pension for the man (*vide* Chapter on Pensions). Most of these men asserted that failure of sight was noted a few weeks or months after the head injuries, whilst others brought up histories of concussion that occurred as long ago as two or more years. The question arises as to the length of the period that may possibly intervene between an injury and the manifestation of late after-effects due to it; for obviously, the more remote the date of injury, the less likely is it for this injury to have a bearing on the case. The tendency of the authorities, if syphilis was proved, was always to ascribe everything to that one factor, and to ignore all else, forgetting that the injury may be the cause of determining the local manifestation of syphilis about the damaged parts, which otherwise may well have escaped, as suggested in a previous paragraph.

Thirteen of these optic nerve degeneration cases have died since my notes of them were recorded; 6 have died in asylums, 3 have died from tabes, 2 from meningitis, whilst 3 more have died from more remote causes.

The following cases possess special points of interest. Three cases of quinine blindness will be noted, and one case of optic nerve atrophy following upon an attack of cerebro-spinal meningitis. Malaria has been designated as the possible causal factor in two cases, and diabetes in one.

Case 3. This was a case of Juvenile Tabes. The lad was aged 21 when I saw him. In the right eye, the vision was p.l., whilst the left eye was quite blind. He gave a history of failure of sight since thirteen years of age. He was accepted for service (R.D.C.) in B 2 Grade, and after seven months he had to be discharged on account of progressive failure of vision. Since then he had developed weakness in the arms and legs, and also showed signs of mental failure. Knee jerks were absent.

Cases 15, 43 and 91 were all instances of Quinine Blindness, and on this account are worth recording.

Case 15 was that of a man aged 27, who had been a prisoner in Turkey for three and a half years, where he had suffered a great deal of bad treatment. Whilst a prisoner, he had many severe bouts of malaria, and was given a great deal of quinine, both by the mouth and by injections. He stated that he lost the sight of both eyes quite suddenly, and in the space of a night. He was very weak and ill from malaria at the time, and was being dosed with quinine in large quantities. He recovered a little sight after about three weeks, but since then matters have been more or less stationary. His vision was reduced to p.l. in each eye, and both pupils were very sluggish. The fields were contracted almost to fixation point, and the discs were very pale. The vessels were of a good size, and there was no atrophic cupping of the nerve heads.

Case 43 occurred in a man aged 38, and both eyes were completely blind. He gave a history of sight-failure when in India, where he suffered greatly from severe bouts of malaria. He gave a clear history of a central amblyopia as his first symptom. One day, after an especially severe bout of malaria, the sight suddenly failed altogether. The discs were very pale and shrunken, the lamina cribrosa being very plainly marked. The vessel calibre was good, and there were no other lesions.

Case 91. In this case the man, aged 35, first noticed failure of sight when he was on Active Service in German East Africa, and the first symptoms occurred after a severe bout of malaria, at a time when he was taking very large doses of quinine (45 grs. per diem). Both discs were

intensely pale and the vessels showed marked sclerotic change. The vision in the right eye was 6/24 and the field exhibited extreme annular constriction, but the central colour perception was quite good. The left eye had been defective for many years and was divergent. The vision of this eye was reduced to 1/60, and the field was contracted right up to the fixation point, with complete loss of colour-sense, except for blue, which was fairly well perceived. He had never suffered from deafness, and the Wassermann reaction was negative. It is rather doubtful whether this case can be altogether ascribed to quinine. The clinical picture, as well as the history, is suggestive of syphilis as being one factor, at any rate, in the case.

Case 20 was one of Diabetes, complicated by Primary Optic Atrophy and Cataract, the latter being in an incipient stage. The Wassermann reaction was negative, and the urine was loaded with sugar. There were no fundus lesions and no haemorrhages. The man was aged 39, and the vision was reduced to p.l. in each eye with extremely restricted fields. Optic atrophy, occurring by itself as the only fundus lesion, is a very rare complication of this disease, and made one suspect the complicity of syphilis, but I could discover no evidence of the latter disease.

Case 88 was one where the Optic Atrophy followed upon an attack of Cerebro-Spinal Meningitis, when the man was on Active Service in France. Sight failure commenced during the course of the disease, about ten months before I saw him, by which time the man was completely blind in both eyes. The discs were intensely white, the vessels being of normal size, and there were no signs of previous neuritis or of any other form of ocular inflammation. The Wassermann reaction was negative. It is interesting to compare this case with three previously reported cases of destructive inflammation coming on during the course of this disease, and also with two cases recorded later on, where the blindness was due to secondary optic atrophy (*vide* pages 58, 73, 74).

Case 98 was one of blindness occurring in a man aged 24, in whom loss of sight followed upon an acute illness, which was recorded in his medical case-sheet as Acute Spinal Meningitis, during the course of which he suffered from paralysis of both legs. This illness occurred about twelve months before I saw him, and whilst he was still under treatment the sight seems to have failed. The patient himself was extremely vague, and, unfortunately, owing

to the death of the surgeon in charge, the notes of his illness were very meagre. He was completely blind, and the Wassermann reaction was positive. He had completely recovered the use of his limbs, but knee jerks were absent. His general nerve condition was quite good when he came under observation. There was nothing to be seen in the eyes but a primary optic atrophy, which was very advanced. Probably the illness was of a specific nature.

Cases 100, 101 and 107 record the notes of three cases in which the optic atrophy was complicated by severe chronic endarteritis, and all presented much the same characteristics.

Case 100 was a man of 38, who was completely blind. The arterial change was extreme in both eyes, many of the arteries being bounded by narrow white lines. The discs showed no signs of previous inflammation. The patient died of meningitis seventeen months after he came under observation.

In Case 101 the man, aged 35, showed definite signs of early tabes, and the Wassermann reaction was positive. He died three years after I saw him, from tabes.

Case 107 was that of a man aged 39, in whom the failure of sight commenced when he was on Active Service in France. The arterial changes were very severe in both eyes, and the man was quite blind. This patient ultimately became mentally affected, and died in an asylum about four years after the commencement of his sight failure.

Case 109 was interesting because the loss of sight was followed by symptoms which made it clear that he was affected with **Disseminated Sclerosis**. The patient was aged 27, and he was completely blind in both eyes. He traced the first commencement of his sight failure to a fall six years ago, when he fractured the base of his skull and broke his left arm and leg. He said that the sight was very bad when he was accepted for Active Service. He went to France attached to a Labour Battalion, but the sight then rapidly failed and he had to be invalided. Shortly afterwards he came under my observation, and he then presented marked primary optic atrophy as the only eye lesion, except lateral nystagmus. From that time general nerve symptoms, due to disseminated sclerosis, rapidly developed and ultimately he became insane, and died in an asylum about fifteen months after I had first seen him.

2. Secondary Optic Nerve Degeneration

Number of Cases 44

The only fundus lesion in any of these cases was a secondary atrophy of the discs, with the usual pressure effects exhibited in a varying degree by the retinal vessels. The history of many of the cases was very vague and unsatisfactory. A large proportion of the cases were undoubtedly specific in origin, but in only a minority of these was a positive Wassermann present.

In 10 cases the ocular condition was undoubtedly the result of increased intracranial pressure, certainly due to the presence of a cerebral neoplasm in 5 instances. In the remaining 5 cases, two had had decompression operations, and were probably cases of cerebral tumour, one had suffered from a traumatic meningitis, another had been diagnosed as a case of cerebral tubercle, whilst the last was complicated by one-sided facial paresis. Of these 10 cases, 3 are already dead, and neoplasm was confirmed by post-mortem examination in 2 instances. A short account of all these cases is given below.

In 2 instances the optic nerve swelling and atrophy followed on an attack of cerebro-spinal meningitis. In the preceding section I have described a case of primary optic atrophy, due to this cause, and, under the heading of Inflammatory Disease, notes of three cases were recorded, in the course of which the eyes were destroyed by destructive uveal inflammation.

Two cases, probably specific, developed marked symptoms of mental failure after they had been admitted to St. Dunstan's, and had to be certified. Both cases died some months later. The interesting point in one case was the presence of definite signs of early tabes, as it is a disease one does not usually associate with secondary optic atrophy.

In another case there was a paresis of both external recti muscles, the other extrinsic muscles of the eyes being apparently quite normal.

The following are the histories of five cases of certain cerebral tumour (Cases 6, 15, 31, 42 and 44).

Case 6. The patient was aged 32, and was completely blind in both eyes. His symptoms commenced with bouts of severe headache about twelve months before he came

under my observation. The sight began to fail some weeks after the onset of headache, and progressed to complete blindness in six months. No decompression operation was performed. The fundi showed that there had been an intense swelling of both discs, with subsequent atrophy. X-ray plates indicated a neoplasm at the base of the skull, pressing upon the optic chiasma, and not amenable to operation. The posterior clinoid processes were destroyed.

Case 15. This patient was a lad of 21 when he came under observation, and both eyes were completely blind. He gave a history of failure of sight about two years previously, and when he came to me he was suffering from pronounced ataxia, with a tendency to fall to the right. He was still getting a great deal of headache and bouts of vomiting, which made the diagnosis of a cerebellar neoplasm practically certain. The lad was pathetically anxious to come to St. Dunstan's, and as his general condition was not very bad we took him into the Hostel, where his remaining time would be made as comfortable as possible. The boy was still alive two years later, but was in a very bad way, and death was not likely to be deferred for more than a few months.

Case 31. This patient was also a lad of 21 years when he came under observation and quite blind. He gave a history of commencing failure of sight about six months after he had joined the Army, and he had been discharged on account of blindness eighteen months before I saw him. Both fundi showed that there had been an intense swelling of the discs, and the vessels were extremely thready. No decompression operation had been performed. The Wassermann reaction was negative. The eyes were nystagmic. He exhibited weakness of the right facial muscles and some inco-ordination of the right arm. He gave a history of two fits before he came to St. Dunstan's. Two years after this note was made there was no material alteration in the nervous symptoms, but the eyes had become intensely prominent, without any limitation of movement, and he was suffering from occasional fits.

Case 42. The patient was aged 31, and quite blind. The sight began to fail some months before he came to me, while he was in hospital under treatment for an abdominal wound. Failure rapidly passed to complete blindness. All along he had suffered from severe daily headache, and was still complaining. No decompression operation had been performed. The discs exhibited a secondary atrophy following an intense swelling, and the

arteries were extremely pale and thready. The general nerve condition at the time of this note was good, and he was admitted into St. Dunstan's, but he gradually developed general nervous symptoms pointing definitely to a cerebral neoplasm, and death ensued twenty months after his first examination by myself.

Case 44. This man was aged 29 and quite blind, and gave a history of the sight failing for about two years. The fundi exhibited secondary optic atrophy subsequent to a very intense nerve swelling and the arteries were extremely thready. He had no other symptoms when I first saw him, but after his admittance he developed general nerve signs pointing definitely to a cerebral tumour, from which he died about a year after his admittance.

The following five cases (4, 11, 20, 37 and 43) were instances where the secondary optic atrophy was due to increased intracranial pressure, but in which the diagnosis of cerebral neoplasm was not definitely made.

Case 4. The patient was aged 25. His right eye still retained a slight perception of light, but the left was quite blind. The sight failure commenced with diplopia and rapidly progressed to blindness in the left eye, the failure in the right being less active. He had suffered very much from headache and bouts of vomiting during the early stages of his illness, but all these signs had passed off when he came to me, and his general condition of health was fairly good. The Wassermann reaction was negative. The fundi exhibited a moderate degree of swelling and subsequent atrophy with thready vessels. This patient is still alive, and in much the same condition as when I made this note, over two years ago.

Case 11 was a man aged 27. His right eye still retained a slight perception of light, his left being completely blind. He gave a history of intense headache and sickness occurring about four years previously, and followed by progressive failure of sight. A decompression operation was performed, and when I saw him there was a very large cerebral hernia over the right temporo-sphenoidal area. Both discs showed advanced secondary atrophy, the preceding swelling having been very severe. The vessels were very shrunken. The general nerve condition was good, and the history and symptoms seemed to point to the presence of a tuberculous mass. This patient was still alive when I last saw him, and in fair health.

Case 20. This man was aged 30 when he came under my observation, and was quite blind. He gave a curious

history of sudden failure of sight a week after anti-typhoid inoculation, to which he ascribed his blindness. He had had a most intense swelling of the discs followed by atrophy. The Wassermann reaction was negative. He was exhibiting spasmodic twitchings and paresis of the left facial muscles, but no other nerve signs. No decompression operation had been performed. This patient is still alive.

Case 37. The man was aged 36 and was quite blind in both eyes. He gave a history of a severe concussing blow on the top and left side of his head from an engine jack weighing about 1 cwt., which fell on to his head from a height of about 9 feet. Whilst in hospital his sight rapidly failed. No decompression operation had been performed. The fundi exhibited the result of an extremely severe unrelieved swelling of the discs and secondary atrophy, probably the result of meningitis and increased intracranial pressure. The patient was in good health, and showed no evidence of any other nerve lesion. This patient remains perfectly well, except for his blindness.

Case 43. The patient when I saw him was aged 31, and quite blind in both eyes. He gave a history of a very bad fall on the back of his head, about twelve months before, which was followed by rapid failure of sight. A decompression operation was performed shortly after the sight began to fail. The fundi exhibited an advanced atrophy consequent upon an intense swelling, the retinal vessels being very minute. The patient had no other nerve signs, but his mental attitude was dull and apathetic. There seemed to be no reason against his admission into St. Dunstan's, and one hoped that his mental condition might improve by being there, but unfortunately, the reverse was the case, and the patient became quite insane and had to be certified. He died in an asylum about seven months after this note was made, but there was no post-mortem examination.

Cases 24 and 36 were instances of Optic Neuritis and subsequent atrophy, associated with Cerebro-Spinal Meningitis. In both these cases the diagnosis is rather doubtful. One of them was only described as a "carrier" of the disease, and in the other the man reported himself that he had suffered from meningitis, but I could not ascertain for certainty whether this was so or not. I give the histories for what they are worth.

Case 24. The man was aged 35, and the sight began to fail when he was in an Isolation Camp as a "positive

carrier" of cerebro-spinal meningitis. Both fundi exhibited shrunken white discs, with a good deal of surrounding organised white exudate, and very thready arteries. The Wassermann reaction was negative, and there were no signs of any disease of the general nervous system. The man still retained a slight amount of vision in both eyes, being able to count fingers held just in front of him.

Case 36. The history in this case was that the man, who was in the Navy, had an attack of meningitis (*sic*) about twelve months before he came for examination. During the course of his illness his sight failed rapidly. The Wassermann reaction was negative. Both discs showed evidence of an extremely severe swelling in the past and subsequent atrophy. The vessels were extremely thready. He still retained a little sight in both eyes, amounting to about 1/60 in the right, and bare p.l. in the left.

CHAPTER VI

NON-TRAUMATIC BLINDNESS (*continued*)

DETACHMENT OF THE RETINA

Number of Cases 29

THIS list contains the records of 29 cases of retinal detachment, secondary to disease or due to some cause other than wounds. It includes three cases, the result of blows on the eyes, but in all three the history had no reference to Military Service, and so it was thought best not to include them in the list of Traumatic Cases.

In 17 cases of the series the detachment was bilateral, and in 6 of these, the failure of both eyes was reported to have occurred simultaneously. In the remaining 12 cases, in which the detachment was unilateral, the other eye was also blinded from various causes.

In six cases, the detachment occurred in aphakic eyes, one being a case of bilateral needling for high myopia, whilst the other five were cases of lamellar cataract, in four of whom both lenses had been needled. A short account of all these cases of detachment of the retina in aphakic eyes is appended below, as they form an instructive little group.

They serve to enforce the point, not sufficiently urged in text books, of the inexpediency of needling both lenses, unless the sight is hopelessly bad in both eyes. There is always a slight risk of a subsequent retinal detachment in aphakic eyes, and especially is this the case when dissection has been followed by a curette-evacuation of the lens. The risk is not lessened by lapse of time, for I have known detachment to occur in both eyes forty years after operation.

Undoubtedly, cases of bilateral aphakia are not suited for Military Service, and I trust that this point will be recognised in the future.

In eight other cases the detachment seemed to have been secondary to old standing disease of the uveal tract, often

associated with considerable retino-choroidal atrophy. These cases do not possess any points of special interest, with one exception (Case 26), of which a short account is given below.

Three cases of detachment were associated with Retinitis Proliferans, and all are worth a short account.

In three instances, the detachment was associated with Myopia, one of them being the case just mentioned in which the lenses had been needled. One of the other two gave a very interesting history, and the case is recorded below. Myopia as a cause of war-blindness is dealt with in the next chapter, and in three of the cases there mentioned there was probably a detachment in one eye. However, this point could not be diagnosed for certain on account of the presence of cataract or other obstacle to deep examination, so they have not been included in this list.

In nine cases, the cause leading to detachment was speculative, and they form a very interesting group. Eight of them exhibited a bilateral detachment, and in five of the eight cases the detachments seem to have occurred simultaneously, or within a very short period—a day or two at most—of each other. In the remaining three, the interval between the detachment of the first and second eye was about two years, three years, and two years respectively. The ninth case was that of a man whose left eye had been removed some time previous to the detachment in the other eye, owing to a post-operative inflammation following treatment for a cataract, which was probably traumatic in origin.

None of these nine men had suffered from any previous trouble with their eyes, except the case of unilateral detachment just mentioned, and one other man, who stated that the vision of one eye was "weak" when he joined the Army. None of the men could assign any cause for their blindness, and all were in good health at the time the detachment occurred.

In none of these cases were there any signs of past or present inflammatory trouble, but in two of them the vitreous was murky, suggestive of an intra-ocular haemorrhage. None of the cases were myopic, and none had ever worn glasses. The retinal detachment was the only clinical sign in all of them, excepting a hazy vitreous just mentioned as being present in two cases.

The age-incidence of the detachments in these nine cases

is interesting. When they came under my observation five were under the age of 30 years, two of them being only 19 years of age, and the eldest of the five 27 years of age: two were aged 31 and 32 respectively, and two had reached the age of 41 and 43 years. Thus, seven of the nine cases occurred in men who were in the prime of youth.

One was led to the conclusion that these cases were examples of one or other of two comparatively rare, but well-recognised classes of retinal detachment. The more rare of these two classes consists of a group of cases, mostly occurring in young adults, with apparently perfectly healthy eyes, in whom there appears to be a special tendency for the retina to become detached without any obvious reason, or following upon some trivial cause by which the eyes are jarred.

In the other group, of which I have seen a fair number of proved examples, and which also most commonly occurs in young adults, the detachment is the result of a deep intra-ocular haemorrhage, the causal factor being an altered condition of the blood, whereby its coagulation-time is considerably delayed or accelerated. The vessels themselves are perfectly healthy, but the change in the constitution of the blood, especially in the direction of increased fluidity whereby the coagulation-point is much delayed, alters the normal relationship between the vessels and their contents, which favours a leakage. I am sorry to say that, owing to the exigencies of the times, I had little opportunity for making any complicated research, and I only tested this point in one case, in which, however, nothing abnormal in the constitution of the blood was discovered.

I append (p. 81) the history of one of these cases (**Case 3**), which is perhaps the most interesting of the series and serves to illustrate the others, which are of similar character.

The following are the notes of six cases of Detachment occurring in Aphakic eyes.

Case 2. The patient in this case was aged 21, and he was quite blind in his right eye, whilst his left still retained perception of light. Both lenses had been needled for myopia when he was ten years of age. He earned his living as a labourer before being accepted for the Army. After four months' home training he experienced a sudden

failure of the right vision, and he was invalided. He then assumed his old employment as a labourer, but very shortly afterwards the left vision also failed in a similar way. Both eyes exhibited a large detachment of the retina.

Case 12. This man, aged 38, had a shrunken blind eye, the result of a scald when a child. The left was needled when a child, for cataract. He was accepted for the Army. Whilst going through gas drill he fell down partially suffocated, and was unconscious for about half an hour. When consciousness was regained, he found that his sight had become extremely bad. The retina was found to be almost completely detached, and the man was quite blind.

Case 15. This was a case of old lamellar cataracts. The man was aged 23, and had had several operations on both eyes between the ages of six to twelve years. Operative measures were unsuccessful in his left eye, which had never been of any use to him. Examination showed that there had been severe irido-cyclitis, and the pupil was blocked by dense exudate. The vision in the right eye suddenly failed soon after joining the Army, the predisposing cause of the failure being vague and doubtful. A large inferior detachment of the retina was present in this eye.

Case 21. The patient in this case was aged 23, and he was quite blind in both eyes. He had had operations for cataract on both eyes when a baby. He wore cataract glasses as a young boy, and gave them up when about seven years of age, except for lessons, and he managed to pass the Fourth Standard. He was accepted for the Army, but very shortly afterwards vision suddenly failed in both eyes without any obvious reason, so far as the patient was aware. Both pupils exhibited clear capsular gaps, with abundant posterior synechiae. The fundus reflex was practically abolished in both eyes, and the retina was completely detached and very far forward.

Case 23. In this instance the man, aged 23, was quite blind in the right eye, but still retained some light perception in the left. He stated that he had had very defective sight as long as he could remember. Both eyes were treated for cataract when he was a very young child. The right eye was not a success, and the patient said that he had never had any useful sight in it. Whilst serving in a Labour Battalion in France he suddenly lost the sight of the left, the only useful eye. He stated that at the time he was doing heavy manual work on slippery ground, and it was while at work that he was blinded. Both eyes exhibited a large detachment of the retina.

Case 24. This man was aged 35, and his right eye was completely blind, the left still retaining a slight perception of light (eccentric). Operations for cataract had been performed in both eyes when he was a boy. He was refused several times for Military Service, but finally was accepted and graded B 2. He stated that he was then quite blind in the right eye, though how long he had been so he did not know. He served eight months in France, and whilst he was there the left vision suddenly failed. He could give no satisfactory account of this. Examination showed that there was very large and forward detachment of the retina on each side, the fundus reflex being almost abolished.

The notes of three cases of Retinitis Proliferans, which caused retinal detachment, are here appended. In the next chapter, dealing with Miscellaneous Cases, will be found the notes of a case of retinitis proliferans which was unaccompanied by detachment.

Case 13. The man was aged 32. He lost the sight of the right eye as a young child, the cause being unknown, and this eye was completely blind. He gave a history that about two years before I saw him the left vision suddenly failed, with signs of inflammation in the eye. The vision in this eye was reduced to 2/60. Examination showed that the loss of sight in the right eye was due to a long and broad vertical rupture of the choroid, close to the *inner* side of the disc, which is a rather interesting point (*vide* pages 12 and 33). In the left eye there was a large inferior detachment of the retina, with hazy vitreous containing strands of organised tissue, which appeared to be clawing away the retina from its bed. He had probably had a large intra-ocular haemorrhage, with the formation of fibrinous webs.

Case 28. The history of this case was vague. He stated that he had had good sight in both eyes when he joined the Army in 1914. Very shortly afterwards he noticed that he could not see with the left eye, and a few days later the sight in the right eye suddenly failed in a similar manner. The man could give no sort of explanation of the blindness in either case. The left eye was quite blind and the lens cataractous. In the right eye he still retained some perception of light, and the eye exhibited bands of organised tissue in the vitreous clawing away the retina, which was freely detached. There could be little doubt that in each eye the blindness was primarily due to an intra-ocular haemorrhage.

Case 29. This patient was a mere lad of 19, quite blind in the right eye, and with bare perception of light in the left. He gave a history of rapid failure in both eyes soon after joining the Army, but could assign no cause for it. He was invalidated on this account without going on Active Service, and for nearly two years afterwards was under observation and treatment at a military hospital. The diagnosis on his case-sheet was retinitis proliferans with bilateral detachment of the retina. A very large and forward detachment could be made out over the lower fundus in each eye. The vitreous was very hazy and the tension markedly minus in each eye.

The histories of the three cases mentioned below, where the detachment was caused by blows, are worth recording, because they are of a somewhat unusual character.

Case 9. This case was a man aged 26, his left eye being completely blinded by a blow when boxing as a lad of about fifteen years of age. This eye was cataractous, and the pupil completely blocked by synechiae. Probably there was a retinal detachment in this eye. When under the influence of alcohol he knocked up against a lamp-post and received a nasty blow, which badly bruised his face and blinded his right eye. Examination showed that there was a large detachment of the left retina with hazy vitreous.

Case 10. The patient was aged 37. The right eye was blinded by a blow about five years before I saw him, the eye being shrunken and the lens opaque. Six months before he came to St. Dunstan's, and when in the Army, he was suddenly blinded in the left eye by a blow from a drunken comrade. A large, white, opaque and forward detachment of the retina occupied the whole of the lower segment of the fundus.

Case 18. This was a case of bilateral detachment of the retina, the patient being myopic. He was aged 44 and was a wireless operator on board ship. He gave a history of striking his face against a funnel-stay at night, when the ship was rolling. The accident does not seem to have been severe, and it did not concuss him or cause him to fall, but three days later he suddenly lost the sight of both eyes. The vitreous in each eye was very murky, and the retina very extensively detached.

The following (Case 26) is an example of detachment which was secondary to old standing disease of the choroid.

It presents some rather interesting features which make it worthy of record.

The patient was aged 28, and he gave a history that his sight was defective in both eyes before he was accepted for the Army. Soon after joining he had a bad attack of influenza, after which his sight became very much worse, and he was invalided. In both eyes the vision was reduced to the counting of fingers held close to the eyes. The right eye exhibited a large inferior retinal detachment with a considerable amount of pigmentation and choroidal atrophy in the neighbourhood. At the macula itself there was a small buff-coloured scar dotted with some minute cholesterin crystals. The left fundus showed a band of wrinkled retina below the disc with pigmentation and atrophy all round it, and there was also some delicate wrinkling of the retina round about the macula. More peripherally below there was a small inferior detachment, and much scattered choroidal atrophy about it. The aetiology of the case is uncertain, but it seems probable that haemorrhage played an important part.

The following is the history of one case (Case 3) of the speculative group of retinal detachment above discussed.

The patient was a man aged 24, of unusually powerful physique. He had always been a very strong and healthy man, and had never had a serious illness. He stated that one day, when walking in the sun in Egypt, where he was serving, he experienced a sudden failure of sight in both eyes, being, as he described it, practically blinded. He was taken into hospital for about a fortnight and then sent back to England. He stated that no special treatment was adopted, and whilst on board ship he was allowed to walk about and amuse himself as he liked. Examination showed a very large detachment in each eye, which involved the whole lower half of each fundus. The media were perfectly clear and there was no sign of haemorrhage or past or present inflammation. The tension was slightly minus. A thorough pathological examination was made of this man's condition and nothing was found. The Wassermann reaction was negative, and the blood-count normal in every way. I tested the coagulation-point, but nothing abnormal in this direction was discovered. Chances of treatment being of much use after the lapse of nearly twelve weeks since the failure of sight seemed very slight, especially in the case of the left eye, in which the retina was already very opaque; but I took him into hospital and did a drainage operation in both eyes,

removing a disc of 3 mm. diameter from the lower sclerotic, opposite the detachment. He was kept in bed for six weeks afterwards, the vision and field of the right eye being very much improved; but the operation in the left eye failed to mend matters. Nine months later he maintained the improvement of vision in his right eye. He regained a very fair field of vision and could read 4/60, whereas at the time I first saw him he had bare light perception. The left eye was practically blind. The cause of the detachment was extremely obscure. Probably it was due to a choroidal haemorrhage, but when I saw him the fundus reflex was very good in the right eye, and the fluid which exuded at the time of operation was serous and nearly transparent.

CHAPTER VII

NON-TRAUMATIC BLINDNESS (*continued*)

MISCELLANEOUS CASES

Number of Cases 97

THIS collection contains many varied and interesting examples of eye disease, and the most convenient plan will be to discuss each group of cases separately.

BLINDNESS ASSOCIATED WITH CENTRAL SCOTOMATA

This forms a group of 17 cases of a most interesting nature. Three of them were undoubtedly instances of Leber's Family Atrophy. Four, or possibly five more, seemed to belong to the same class, but in them the family history of bad sight was lacking. All these cases are reported below, and I have added the histories of a further five cases of blindness associated with central scotomata, which were of a somewhat speculative character, but well worth recording.

Leber's Family Atrophy.

Case 3. In this case the man was aged 28 years. He had entirely lost his central sight, but retained eccentric vision in both eyes. He had served in a Home Battalion for about eighteen months, and was then discharged on account of failing sight. The discs were very pale, but the vessels good. There were no fundus lesions. The peripheral fields were normal, but there were large central scotomata, absolute both for colours and white objects. His health in the Army had been good. X-ray examination showed nothing abnormal. He stated that he had a younger brother who was affected with optic nerve disease, but no other members of his family suffered with any affection of their sight. So far as he knew the trouble in his case commenced about two years before, when aged 26 years. He then noticed that things in front of him were blurred, whilst he could see quite well round

the area of defective sight. As time went on this condition became more and more emphasised, until he was quite unable to see at all immediately in front of him.

Case 93. The patient was a man aged 24, and the vision in each eye was 6/60. He served for two years in the Army, eighteen months of which was in France; he was never wounded and had enjoyed good health. He stated that his sight had been somewhat defective since he was a young boy, but it became much worse whilst he was in the Army, and it was on account of this failure that he was discharged. The discs were pale and shrunken, and the pupils semi-dilated and almost immobile. The visual fields exhibited much annular contraction with large central colour scotomata. Two of his brothers suffered from very defective sight, and his mother's three brothers all had a similar defect.

Case 94. This man was aged 35 years, the vision in the right eye being 2/60 and in the left 1/60. He stated that he never could remember having good sight. When he joined up he was graded C 2, and served in a Labour Battalion for two years, when he was discharged on account of increasing failure of vision. Before the war, he had sufficiently good sight to work as a plumber. The discs were very pale, but the vessels were healthy and there were no fundus lesions. The peripheral fields were normal and there were large central scotomata with complete loss of all colour-sense. The Wassermann reaction was negative and his general health condition good. He stated that a brother, who died at the age of 39 years, had also suffered from very defective sight since early boyhood, and was nearly blind when he died. His mother also had had very bad sight all her life.

The following four cases suggest that they belong to the class of Leber's Atrophy.

Case 45. The patient was aged 20 years. He had completely lost all central vision, but retained some eccentric sight in both eyes. He was rather highly myopic, but lenses were quite useless to him. He gave a curious history of failure of sight for about nine months previous to my seeing him, and the trouble commenced whilst he was undergoing training in the Army at home. He was a perfectly healthy lad, and had never been seriously ill. Both discs were decidedly pale, but the vessels were healthy and there were no other lesions. He had large central scotomata, absolute for colours, and over a small area immediately around the centre the scotoma in each eye was absolute for white. The peri-

peripheral fields were normal. Before the war he was a labourer in tin works. There was no family history of defective sight.

Case 48. This lad was aged 19 years. He had completely lost central vision, but had some slight perception of light. He stated that his sight was quite normal when he joined the Army, but had begun to fail whilst he was on Active Service in France, immediately following an attack of influenza. The pupils were slightly unequal and sluggish. Both discs were markedly pale, especially on the outer sides, and the physiological cups were almost obliterated. The outline of each disc was quite sharp, and the vessels healthy, and no other lesions were present. The Wassermann reaction was negative. Both fields were entirely eccentric, and restricted to a small area on the outer side. That on the left, which was the larger of the two, reached at one spot nearly to the fixation-point, but on the right side the field at no spot approached nearer to the fixation-point than 20 degrees. The picture suggested a primary retro-bulbar neuritis which had progressed to blindness, the exact cause being doubtful. There was no family history of blindness.

Case 51. In this case the patient was aged 21 years. Central vision was completely lost in both eyes, but he had some eccentric sight in each, amounting to 2/60 in the right, and 4/60 in the left eye. He stated that he was a linotype operator before joining the Army, and had excellent sight. He served in the Army for eighteen months and went to the Front. Whilst on Active Service his sight began to fail, though he himself was in good health, and had all his life been a healthy lad. Both discs were markedly pale, but the vessels were healthy, and there were no other fundus lesions. The Wassermann reaction was negative. The fields exhibited large central scotomata, which were absolute for colours, and over a small area immediately round the fixation-point, were absolute for white. The right peripheral field was a good deal contracted over the upper half, but elsewhere was of normal dimensions. The left peripheral field was practically normal in every direction. There was no family history of defective sight.

Case 94. This was an extremely interesting and difficult case. The man was aged 24, and was a sick-bay attendant in the Royal Navy. He had completely lost all central vision, but eccentrically could count fingers with each eye at a short range. One day, when on board ship, he noticed a central blurring of the left vision, and a few days afterwards he noticed a similar blurring of the

right sight. He could give no sort of explanation beyond a history that, about four months previously, he had been knocked down by a delirious patient, and had received a bad blow on the back of the head. However, the blow was not sufficiently severe to make him report as "sick." He stated that the sight progressively became slowly worse, and on account of increasing failure he was finally invalidated from the Navy six months after he had first noticed the affection of his vision. He stated that at the time of his discharge he was practically blind. He had undergone treatment at various hospitals without any benefit, and there had also been an exploratory operation of the nasal sinuses, which were found perfectly healthy. The Wassermann reaction was negative. The right disc was universally pale, the left markedly pale on the outer side only. The physiological cups were deep and white, and the arteries somewhat small and pale. There was a very large and absolute central scotoma in each field, extending fully 10 degrees round the fixation-point, and there was also some concentric contraction of the peripheral fields, especially on the right side, where the field was limited to the 40-degree circle on the inner side, and to the 50-degree circle on the outer side. There was no family history of blindness.

I have classified the case in this group, as it is just possible that it may belong to the Leber's atrophy class; but the most likely explanation seems to be that it was a case of acute retro-bulbar neuritis, the cause of which was never discovered. Another possible explanation is that the man received some injury to the visual cortex at the time that he was knocked down, which resulted in subsequent degenerative changes.

The following five cases are examples of blindness, the result of Central Scotomata, due to other causes than Leber's Family Atrophy.

Case 64. The patient was aged 34. The vision in the right eye was reduced to the counting of fingers at short range, whilst in the left he retained eccentric perception of light, but had completely lost all central vision. The sight was said to be perfectly normal when he joined the Army, and he was a big healthy man. He had been on Active Service at the Front about twenty months when the vision suddenly failed in his left eye, and this was followed a week later by a similar failure in the right. He stated that he had a very bad cold at the time, which

was the cause of much headache. Three months previously he had experienced a bad blow on the back of his head, from a fall off his horse, by which he was rendered unconscious for a few minutes. The failure of sight was very severe from the outset, and the man was invalided out of the Service about four months after the onset of symptoms. The Wassermann reaction was negative. Both discs were extremely pale, the physiological cups and vessels being normal, and no other fundus lesions were present. The right peripheral field was normal, but the left was considerably contracted throughout. There were large central scotomata, absolute for all colours and also absolute for white in the case of the left eye.

When he came to St. Dunstan's his chief complaint was intense and blinding headache. This came on in almost daily bouts, which completely incapacitated him from taking any active interest in anything. After admission to St. Dunstan's, as ordinary treatment did not improve his headache, I asked Mr. (then Major) Somerville Hastings, my colleague at the Middlesex Hospital, to examine him, and he undertook an exploratory operation to investigate the condition of the nasal sinuses. Nothing was actually found, but the headache was at once completely and finally relieved. Unfortunately, this relief did not extend to the sight, which remained as before. Twelve months after operation he continued to be perfectly well and free of headache, but he was practically blind. There can be very little doubt that the sight failure was due to an acute retro-bulbar inflammation resulting from some affection of the ethmoidal or sphenoidal sinuses.

Case 56. The patient was aged 40 years, and the sight in the right was reduced to 3/60 and in the left to 2/60. He stated that his sight was perfectly good when he joined the Army. Whilst on Active Service at the Dardanelles he had an attack of dysentery, and when convalescing the sight failed rapidly in both eyes. He was invalided from the Service six months later. The optic discs were pale and the vessels normal. He had large central scotomata over which the colour-sense was very defective, but not absolutely abolished. The peripheral fields were both normal. Twelve months after the above note the condition was precisely the same.

There seems to be an undoubted relationship in this case between the dysentery and the blindness. I have not been able to discover a record of any other case of blindness from this cause associated with dysentery, but there seems to be no other explanation.

Case 62. The patient was aged 48 years. The right eye was quite blind and the left vision 5/60. He gave a curious history. The right eye was lost by an injury due to the bursting of a bottle some years previous to his joining the Army, and this eye exhibited a detachment of the retina. In 1914, just before the War, he was treated at hospital for tobacco toxæmia, and his vision in the left eye was then reported to be 6/60. Under treatment he became much better and ultimately he joined the Army. Whilst on Active Service his sight once more failed, and he was discharged on this account about two years before I saw him. His vision had never improved again, and when he came to me he had developed some weakness of the right arm and leg. The left disc showed considerable pallor, with some blurring about the inner and upper margin. There was a large central colour scotoma, and some considerable contraction over the inner and upper segments of the peripheral field. Examination of his general nervous system revealed nothing definite.

This case clearly seemed to be one of old tobacco poisoning, which had progressed to practical blindness, and the weakness of his arm and leg most probably was due to a peripheral neuritis.

Case 63. The man was aged 27 years, and his sight in both eyes was reduced to 2/60. He gave a history of sudden failure of sight in both eyes, following very shortly upon his being knocked down by shell-concussion. He received a severe blow on the back of his head, but was not rendered unconscious. He stated that the present condition of his sight was reached in two days, and from that time it had never shown any improvement. This was about nine months before I saw him. Both discs were very pale, the vessels and cups being normal and no other lesions being present. Both the peripheral fields were of normal size, but he had a fairly large central colour scotoma. The Wassermann reaction was negative.

This case clearly suggests some injury to the visual cortex; but it may have been one of acute retro-bulbar neuritis, which had gone on to permanent atrophy of the macular fibres of the nerve.

Case 65. This was a case of a man aged 23 years, in whom the vision was reduced in both eyes to 1/60. The history was a curious and unusual one. He stated that his sight rapidly failed when on Active Service in France,

but he was not finally invalidated until about fifteen months after he first noticed his defect. He had never been wounded or sick whilst in the Army, and he could not attribute his blindness to any cause. The Wassermann reaction was negative. Both discs were markedly pale, and there had obviously been some swelling in the past. The margins of the discs were slightly blurry, the cups were filled in, and the arteries pale and small. The fields exhibited large central scotomata, which were absolute for all colours. Both peripheral fields were of quite normal dimensions. The nasal sinuses were reported to be quite healthy.

Failure of sight in this case does not appear to have been particularly rapid, and in this respect it differs from the usual history of an acute retro-bulbar affection. It seems quite impossible to offer an adequate explanation as to the primary cause of his blindness.

RETINITIS PIGMENTOSA

This disease claims 28 cases of the series. All were typical examples of the disease in a very advanced stage, but a few were complicated by the presence of a positive Wassermann test. The latter cases, in common with all the others, gave histories of defective sight and night-blindness since early childhood, and the fundus picture in each instance was quite indistinguishable from a typical case of retinitis pigmentosa. Of course, it is possible that vascular disease, the result of congenital syphilis, may have been the causal factor in the production of the clinical condition, but, on the other hand, there was nothing in the fundus pictures to indicate that syphilis had had anything to do with it. The difficulty where syphilis is present, is well recognised, and the grouping of these complex cases with the others seemed the best solution.

Ten of the 28 cases were myopic, the highest grade of myopia noted being corrected by Sph. —10D. Most of the others had considerably less myopia than this.

Five cases exhibited posterior polar changes in the lenses.

All were practically blind when they came to St. Dunstan's, and all of course had been earning their living in one way or other before joining the Army. Their periods of Army Service varied from four months in the shortest case to

four years in the two longest. Most of them were on the Active Service list for a period varying between one and two years.

The age-incidence of their discharge on account of blindness was as follows :—

11 were between the age of 19 and 25 years.

5	"	"	"	25	"	30	"
7	"	"	"	30	"	35	"
5	"	"	"	35	"	40	"

Nineteen was the age of the youngest, and 40 the age of the eldest case.

A large percentage served in the Army abroad, and were classed A 1, but a certain number saw no service abroad, and were relegated to Labour Battalions.

It is scarcely necessary to say that all these cases should have been rejected as unfit for the Army. It is hardly conceivable that any of them would have been accepted if an ophthalmoscopic examination had been made, and they afford further evidence, if such is still needed, for the necessity of securing greater efficiency on the part of examining medical officers. There can be no possible doubt that the blindness which, in any case, was the inevitable fate of all of these men, was very materially promoted and hastened by the conditions of Army Service in time of war.

In civil life one is accustomed to associate the disease with blindness coming on about middle life; but here is a group of these cases, nearly half of whom were quite blind by the time they had reached the age of 25 years, and all of whom possessed sufficient sight to earn their living before they joined the Army.

A most curious feature was the attitude of the Medical Boards, when it came to a question of granting these men disability pensions. In nearly every instance their cases were rejected for pensions, on the ground that their blindness had nothing to do with Army Service. More will be said on this matter in the chapter dealing with pensions, and it is sufficient here to add that ultimately one was able to cause the question to be regarded in a different light, and the men received the pensions to which they were justly entitled.

Most of the cases being straightforward and typical, need no special description, but I have selected four of them for record (Cases 73, 88, 92 and 93) as exhibiting points of unusual interest.

Case 73. This case is recorded because it is a good example of ineptitude on the part of the examining medical officer.

The patient was aged 31, and he first noticed his defective vision when he was about seven years of age, but he reached the Fifth Standard at school. During the war he volunteered for service and was accepted and graded C 1. However, the sight became rapidly worse after joining the Army, and he was discharged on this account eight months later. Eleven months passed after his discharge and he was then called up again, and ordered to rejoin, being graded Class A. He then served in the Infantry for over six months before he was finally discharged on account of his extremely bad sight. The ophthalmoscopic picture was a perfectly obvious and very typical example of the disease in a very advanced stage. Both maculae were much affected, and there was a very general choroidal atrophy in addition to the retinal changes.

Case 88. The patient was aged 25. He still retained a slight eccentric perception of light in the right eye, but was completely blind in the left. He was badly wounded six months before he came to St. Dunstan's. There was a severe right-sided scalp wound near the vertex, and a lacerated wound of the face, beside body injuries. The eyes themselves were not touched. He stated that he was unconscious for about ten days after being wounded, and when he regained his senses he found himself practically as blind as he was when I saw him. He was confident in his assertion that his sight was perfectly normal until the time of his wound. However, examination of the eyes showed typical lesions of extremely advanced retinitis pigmentosa, which must have been of many years' standing. The degenerative changes had progressed right up to the macula in both eyes. The case is extremely interesting on account of the man being so absolutely unaware of any visual defect before his wound. It is very difficult to believe that he had even fairly good sight at the time of his wound, and the fields must have been very contracted. Probably the macular areas themselves had not been invaded at the time he was wounded, and his severe head injury promoted a very rapid advance of his disease and the invasion of central vision.

Cases 92 and 93 are those of two brothers, both of whom I took into St. Dunstan's, who were nearly blinded by this disease. The elder brother was aged 25, and his vision was reduced in each eye to 6/60. He was myopic and wore glasses of Sph. -6D. In the younger brother the vision was considerably better, and he could make out

6/36 with minus glasses. Both lads had had defective sight since early childhood, and had noted that the vision was gradually getting worse as time progressed. The elder brother was on Active Service in France for nineteen months and then invalidated on account of progressive failure of sight. The younger one served for ten months in the Army, with six weeks in France, after which the sight was so bad that he was invalidated. The fundi in both brothers exhibited the disease in a very advanced form, with the visual fields much restricted and showing the usual multiple scotomata. The actual changes in the younger brother's eyes were, however, not so advanced as in the case of the elder. The elder brother was confident that his long period of service in France did his sight a great deal of harm, but the younger brother was of opinion that his Army Service, very little of which was passed at the Front, did his eyes no special harm. Neither brother was wounded or suffered from any sickness whilst in the Army.

The family history was very striking. The mother had poor sight, but the nature of the defect was unknown, but the father had good sight. There were six sons and one daughter. All six sons had bad sight, presumably of the same nature, whilst the sister had escaped. As both these brothers were myopic, it is possible that the bad sight on the part of the other sons was simply due to myopia.

Both these cases had a good deal more sight than, under ordinary circumstances, would have justified their admittance into St. Dunstan's. The disease was, however, so advanced, and the vision so clearly getting worse, that I felt it was best that they should be taken into the Hostel, where they could be taught handicrafts. The instruction they would receive would not fail to be of great help to them in the near future, when they became unable to earn their living as sighted men.

MYOPIA MALIGNANS

In sixteen cases blindness was due to the ravages of high myopia. All of them in whom a view of the fundus was obtainable exhibited gross atrophy of the visual coats round and about the central area, and pale discs. In a small proportion dense vitreous haze, or changes at the posterior pole of the lens, prevented deep examination, and in three of these there was probably a detachment of the retina in one eye.

The grade of myopia was generally very high. In seven cases it was over $-20D$. In one instance the estimation with the retinoscope was $-35D$ in one eye, and $-23D$ in the other. In a third case the myopia amounted to $-26D$ in both eyes, and in a fourth to $-24D$ in both eyes. The least amount noted in any instance was $-10D$ and that only in one eye, the other one exhibiting $-22D$. Curiously enough, the worse-seeing eye in this latter case was exhibiting a smaller degree of myopia, there being much more vitreous haze, and the fundus mischief just as bad or worse than that seen in the other eye.

All the cases gave a similar history of being able to earn their living, and of having fair sight prior to their Army Service, with rapid failure soon after joining the Army. Many of them served various periods in Labour Battalions at the Front, and in most cases their period of service with the Army was long enough to justify their assertion that it had aggravated and precipitated the course of the disease. Anyhow, it is obvious that the cases in this group should have been rejected for Military Service.

The majority of the cases were of the usual type that one is accustomed to associate with myopia malignans. One of them was complicated by congenital syphilis, and one case exhibited an excellent example of that rare condition, known as "*staphyloma posticum verum*."

The histories of three cases are appended below, as being useful examples of inefficiency on the part of the examining medical officers.

Case 49. The sight in this man, who was aged 31 years, was reduced to: Right 3/60 and Left 3/60, with his correcting lenses. Before the war he worked as a bricklayer's labourer, and as a boy at school he reached the Fourth Standard. When he joined the Army he was put into a Labour Company, as he could not see well enough to use a rifle. The interesting part about his case was that he had nystagmus and the fundi exhibited enormous colobomata of the choroid and optic nerve sheath in both eyes.

One would have thought that the nystagmus would have given the examining officer a clue to his unfitness, even if he had not made an ophthalmoscopic examination.

Case 53. This man was aged 39 years, and his vision with his full correcting lenses was less than 6/60 in both eyes. He stated that his sight was extremely defective when he joined the Army. He only served for

about six months, part of which was spent in France, and then he was discharged on account of increasing blindness. When he came to me he was wearing Sph. -10D in each eye. The examination showed that he had -35D of myopia in the right eye, and about -23D of myopia in the left. The central changes in the fundi were very gross. No lenses would give him 6/60, and he had very poor reading sight. No attempt was made whilst in the Army to give him proper glasses.

Case 57. The age of this man was 39 years, and no lenses would give him more than 3/60 in his right and 2/60 in his left. He had had very defective sight since a young boy, but had never had his eyes examined and had never worn any glasses. He was accepted for the Army and served for about twelve months in a Labour Battalion, after which time he was discharged on account of increasing failure of sight. No glasses were ordered in the Army, but after his discharge he was given the glasses he was wearing when I saw him, viz. Sph. -20D, which were quite suitable. Before he joined the Army he was a timber sawyer. The fundi exhibited intense central atrophy, with pale discs.

CHAPTER VIII

NON-TRAUMATIC BLINDNESS (*continued*)

MISCELLANEOUS CASES (*concluded*)

GLAUCOMA

ELEVEN cases in the series were blinded by this disease. Two of them evidently were suffering from it at the time they were accepted for Army Service, as they were discharged almost immediately as unfit afterwards. It is pleasing to be able to record these instances in which the right thing was done, but they also show up the inefficiency of the medical officers who accepted the men in the first instance.

Operations had been performed in 7 cases, and in 6 on both eyes. Scleral trephining was the method chosen for *both* eyes in 4 cases. In one instance scleral trephining was performed in one eye and iridectomy in the other, and in another case, recorded below, iridectomy was performed in *both* eyes, and subsequently the lenses were extracted on account of secondary cataract.

In 2 cases the disease had run on to complete blindness, without any attempt to save the sight by operation. In another, which was a case of buphthalmos with central corneal haze, the tension was not very high, and obviously the eyes to some extent had adjusted themselves to the state of affairs. When this man joined the Army no operation had been performed, and his sight was very bad, amounting to fingers at short range in the right and shadows in the left. He only remained in the Army a few weeks, as he was obviously an unfit case for Military Service. When I saw him I did not think that operation was advisable, as there was no hope of improvement, and there was very little sight to save. The risks of operative interference at so advanced a stage of the disease did not, in my opinion, justify operative interference.

All the cases, with exception of that just mentioned,

in which the man was 24 years of age, were over 30 years old and five of them were over 40 years. Notes of four of them which are specially interesting are appended below.

Case 8. This man was called up for service, but discharged. He was aged 39, and the right vision was p.l. and the left 2/60. An iridectomy had been performed in both eyes several years previously; subsequently he developed cataract in both eyes. An extraction operation had been performed in the right eye successfully, but with no improvement in vision, the disc being very cupped and atrophic. The tension in this eye was normal, but in spite of this the disease had progressed to blindness. When he came to me the left lens was completely opaque and the eye rather hard. I extracted the lens successfully, and with a cataract glass he was able to see 6/60 over a field considerably restricted. The tension remained a little plus and the disc was cupped, though not excessively so.

Case 35. This was a case of a man aged 61 years. His history was a tragic one. He developed glaucoma, and a scleral trephining was performed on the right eye, which was blind. Unfortunately, sympathetic inflammation supervened in the other eye. The right was removed, but the left went to pieces in spite of operation. When he came under my observation he was suffering intense pain and the eye was extremely hard and quite blind. After his admission I removed the other eye, as it was quite impossible to relieve his pain by ordinary means.

Case 46. This was a man aged 37 years, and the interesting point about his case was that he was myopic, with a very high grade of astigmatism in the left eye. When he came to me the right eye was quite blind, but with the left eye he could see 6/36 with Cyl. -6D. He gave a history that sight began to fail when he was in Mesopotamia, about eighteen months previously. A scleral trephining had been performed in the right eye, the tension as a result being fairly normal and the drainage good. The disc was very deeply cupped and the disease in spite of operation had run on to complete blindness. The refraction showed a considerable degree of myopia. In the left eye an upward iridectomy had been performed. The tension remained rather full, and there was a moderate degree of cupping of the nerve. The refraction, which, as mentioned above, showed a very high degree of simple myopic astigmatism, was partly due to the effect of iridectomy.

Case 74. This was a case of a man aged 48 years,

who was completely blind in both eyes when he came to me. The history was an extraordinary one. It appeared that he fell from the height of about 300 feet into the sea from an airship. He was picked up unconscious, and remained so for three days, and he stated that, on regaining consciousness, he found himself totally blind, and had remained so ever since. A scleral trephining operation had been performed on both eyes. Both were intensely hard, and exhibited extreme glaucomatous cupping of the discs; the pupils were semi-dilated. The sequence of events is not clear, but probably he was suffering from chronic glaucoma at the time of the accident, and the latter induced an acute congestion, which speedily caused total blindness.

CATARACT

In 7 cases the primary cause of blindness was cataract.

Four of them were cases of aphakic eyes in which operations had been performed for lamellar or congenital cataracts. In two of the four cases, one eye was very strongly convergent and useless, and, in another, one eye had been removed on account of destructive post-operative inflammation. The cause of sight failure, on account of which this latter case was discharged, is not very clear. In one of the four, the eyes were nystagmic, and of course very amblyopic, and the discs were pale. In another, the case just mentioned, in which one eye had been removed, the man was wounded by shell splinters, one of which smashed the glass eye he was wearing, leaving the other eye untouched. This man stated that the vision failed rapidly after his wound, but examination of the remaining eye showed nothing abnormal. He seemed to have a central amblyopia, but the vision was too bad for any accurate mapping of the field. The case was a perfectly genuine one, and it is probable that at the time he was wounded he received some injury to the visual cortex. In the remaining two cases of aphakia there was a history of very defective sight since early childhood. One had a convergent squint, whilst the other had worked as a basket-maker before the war, an employment usually associated with defective sight. Neither of them was wounded, and neither could explain the blindness in any way, except that the sight gradually became worse during service in the Army. There was nothing to be made out by examination, but the men were certainly incapacitated, though neither was totally blind.

In the remaining three cases the lenses had not been

touched. One was that of a lad, 21 years of age, with nystagmic eyes, wearing Sph. —3D before each, with which he could read about 5/60. His sight had always been very defective, and he was educated at a "special" school. Both lenses showed dense posterior polar opacities of a congenital nature. Fundus details were difficult to see, but the discs were very pale and the retinal vessels thready. The sight had failed badly when he was on service in France, and it was evident that nerve atrophy was the cause of the increase in his visual defect. He served about twelve months in the Army, and was probably suffering from nerve atrophy when he joined. Although he still had a fair amount of sight when he came to St. Dunstan's, I admitted him for training, as he was obviously doomed to blindness before very long.

The second was a case of diabetic cataract. The man was aged 47 and was passing much albumin, as well as sugar. The fundi showed central macular changes.

The third was a case of cataract of the usual senile type, occurring in a man who was aged 45 years when I saw him. One lens had been extracted before the war, but the eye was lost from post-operative inflammation. Whilst serving in the Army the other lens became very opaque, and he was invalided on this account. When he was discharged, he came to St. Dunstan's and asked to be admitted. The cataract was quite mature and the eye, as far as one could tell, quite healthy. I pointed out to him that he would probably get an excellent restoration of sight by operation; but he would not hear of anything being done, and was dreadfully scared at the idea of going through the ordeal of operation for a second time after his first experience. One could sympathise with him very much, but I was much perplexed as to whether he was a suitable candidate for admission. He begged so hard to be accepted, that I undertook to explain the situation to Sir Arthur Pearson, who had a talk with him and allowed him to come. Poor fellow, he was very grateful.

TRAUMATIC NEURASTHENIA (SHELL-SHOCK)

I append the histories of four cases of this type, all of which presented those characteristics which one came to regard as typical of the condition, so far as the eyes were concerned.

I suppose that these men, from one point of view, should not have been admitted to St. Dunstan's. To treat a functional blindness as an organic case is to

foster and encourage the neurosis, and, in that sense, the worst thing possible for the patient. On the other hand, all these four were *old* cases, in a very miserable and helpless condition. They were, above all things, anxious to come into St. Dunstan's, and association with a lot of good fellows in a college like St. Dunstan's might indirectly help them very much. Then, too, one could not shut one's mind to the point that it was very likely that these men would remain functionally blind whatever they had done for them, and, if so, why not let them take advantage of all that St. Dunstan's was willing and able to do?

Lastly, I felt myself that, for all one could tell to the contrary, the functional might not be the only element in the case, and that these men may have sustained an actual injury to the visual cortex, which would not appear on examination of the eyes. If such were really the case, it would have been doing the men a great injustice to refuse them admission. All things considered, then, I believe the right course was adopted, and I have never had any reason to regret advising the acceptance of these cases for training as blind men.

Case 67. The man was aged 40 years. The right vision was reduced to 5/60, the left to p.l. He stated that the left eye was defective when he joined the Army, but he could give no history. The eye was aphakic and the pupil contracted and blocked; probably he had had a traumatic cataract, but deep examination of the eye was not possible. He gave a history of being buried in a shell-burst, after which the right vision rapidly failed. He kept the right eye rolled up, and examination was extremely difficult. Nothing abnormal was to be seen in either fundus or media. The tension was normal and the pupils were equal and brisk to react to the usual stimuli. He had been in this condition for over a year and was not showing any sign of improvement.

Case 80. The patient was aged 32 years, and it was quite impossible to say how much he could really see. For eighteen months he had suffered from traumatic neurasthenia, which came on after the fight at St. Eloi. Since then he had been in several hospitals. He stated that failure of sight was added to his other troubles about six months before I saw him, and that he was getting steadily worse. He was suffering from loss of memory, loss of speech, paralysis of the right arm, and was very unsteady on his feet. He was very pale and melancholic. His

case-sheet reported that no organic nerve lesion was present. It was absolutely impossible to examine his eyes without a general anaesthetic. He maintained the eyelids spasmically closed, and the eyes rolled up and to the left. Nothing would induce him to make any effort towards fixation or to change the direction of his eyes, or to open his lids, and he powerfully resisted any attempt to force his lids apart.

Case 87. The patient in this case was aged 36 years, and his condition was very much like the case just reported. The history stated that he was blown up and buried by a shell-explosion about a year before he came to St. Dunstan's. He had at that time received a wound above the left temple. He stated that he had never been able to see since the time he was dug out. The general nerve condition seemed quite good, but there was a definite history of right hemiplegia, which had now passed off. He kept his eyes continually shut, and strongly resisted all attempts to open the lids. If the lids were forcibly opened, the eyes were rolled up and converged, and he declared that fixation was quite impossible for him. The pupils were small, equal and apparently immobile. Examination, with great difficulty, was made under a mydriatic. The media were perfectly clear and the discs normal. There was no possibility of mapping the fields or of telling what he could really see.

Case 89. This patient was aged 30 years. The history stated that he was knocked down and buried in a shell-explosion at Gallipoli. Later on he had an attack of sunstroke. He said that he was completely blind in the right eye, and that he could only distinguish shadows in the left. He kept his eyes shut and would not readily open them. When the lids were forcibly parted, the eyes were rolled up. The pupils were small, but equal and brisk in action. The condition of his eyes was apparently healthy in every way. His general nerve condition was fair, but he suffered very much from constipation. It was quite impossible to tell how much sight he really had, as he would make no attempt at fixation.

BILATERAL EMBOLISM OF THE CENTRAL RETINAL ARTERY

The histories of two cases which can only be explained as being due to this very rare condition are appended.

Case 19. The patient was aged 38 years, and the vision was reduced to p. l. in both eyes. The history was as follows.

During an air raid he suddenly lost the sight of both eyes, and was seized with great weakness and trembling of the arms

and legs. The next morning the sight was only just sufficient to enable him to find his way about. He was a perfectly healthy man, with good sight previous to this mishap. He was taken into hospital for three months, and quite recovered from his motor symptoms, but remained practically blind. Both discs were silvery white and much wasted. The cups were deep, and there was no sign of any previous swelling. All the vessels, both arteries and veins, were extremely thready. There were no other lesions, and the Wassermann reaction was negative. The condition of his heart was healthy. There was no sign of general vascular disease or affection of the kidneys.

If the history was true, and there was no reason to doubt it, it is difficult to see how any explanation of his blindness can be given, except the one suggested.

Case 77. This was a case of a man aged 44 years, who was completely blind in both eyes. He gave a history of a sudden loss of sight in both eyes three months previously. He stated that whilst he was at work, drawing rations, a mist came over both eyes, which, rapidly increasing in density, rendered him completely blind in about three hours. The vision had never shown the slightest improvement since that time. Both discs were intensely atrophic, exhibiting slight general cupping, and the skimmed-milk blueness of great wasting. All the arteries were extremely pale and reduced to fine threads. There was no evidence of any previous swelling of the nerve. In the right eye there were evidences of retino-choroidal degeneration over the inner segment of the fundus, for which there was no adequate explanation. There was no sign of any degenerative change in the fundus of the other eye. The general health of the patient was excellent, and there was nothing abnormal in the heart or vascular system. As in the previous case, the history and appearance clearly seemed to warrant the diagnosis made.

RECURRENT RETINAL HÆMORRHAGE

The history of this case is given because it is very unusual and interesting. A few other similar cases have come within my experience, but the condition is a rare one.

The man was aged 25 years. He had completely lost all central vision in both eyes, but retained some eccentric perception of light in each. He was a prisoner in Germany

for nine months and according to his own statement was very ill with dropsy and diarrhoea. His sight was not affected at that time, but after his return to England he was suddenly attacked by loss of vision in the left eye, followed a few weeks later by a similar loss of vision in the right. His medical case-sheet showed that the cause was retinal haemorrhage. The right vitreous was extremely hazy, and no fundus details were possible. In the left eye the media were clear and the retina was seen to be ploughed up in every direction by old and recent haemorrhages. A very careful and complete pathological examination of the blood and excreta failed to reveal any cause. I took him into hospital and kept him in bed for some weeks, and the general condition of his eyes cleared up to some extent, but while he was still in bed he experienced fresh haemorrhages, which appeared without any reason at all that one could ascertain.

Most of the cases of recurrent haemorrhage occurring without obvious cause, that I have seen, have been associated with the ciliary and not with the retinal vessels. They have all occurred in young adults, and generally, I think, in men. They form a most curious group of eye disease. It is interesting to compare this case with some cases of retinal detachment already described (*vide* pages 77, 81). Allusion was then made to alterations in the constitution of the blood as a cause of haemorrhage, especially when the coagulation-power of the blood is much diminished. I thought that this case might come under the latter category; but the coagulation-point was found to be normal.

GRAVES' DISEASE

One case was blinded as the result of extremely severe exophthalmos in association with this disease. The case is of sufficient interest to be recorded.

Case 30. The patient was aged 29 when he came to St. Dunstan's, and was completely blind in both eyes. Graves' disease commenced about twelve months previously, and supervened after a long period of four years' Active Service in France. The proptosis of both globes became so severe that the eyelids could not be closed over them. Unfortunately, no attempt seems to have been made to deal with this complication. The eyelids were not sutured or fastened down in any way, and con-

sequently corneal ulceration had set in, which progressed to perforation and complete destruction of the sight. When I saw him, both eyes were still extremely proptosed and inflamed, with the anterior segments completely destroyed. He presented a miserable spectacle, and was suffering extreme discomfort in addition to his blindness. His general condition of health was improving, and the prognosis, except with regard to his eyes, which were in a hopeless condition, was good.

RETINITIS PROLIFERANS

The history of one case of this disease is recorded and should be compared with three other cases, which displayed retinal detachment, and which were described in the previous section dealing with that condition.

Case 41. The man was aged 34 years, and the vision in the right eye was reduced to 6/60, slightly improved by a weak minus lens. The left vision amounted to p. l. He served for about two and a half years in the Army, about seventeen months of which was passed at the Front in France. He gave a history of very sudden failure of sight in the right eye while on Active Service, which occurred without any obvious cause. The vision gradually improved again, but after some months he had a similar sudden failure in the left eye, waking up one morning to find himself completely blind in this eye. The left vision has never shown any improvement since that time. The right fundus exhibited two large masses of fibrous tissue in the vitreous, which passed back to the retina and seemed to be directly attached to some of the upper branches of the central retinal vein. No detachment of the retina was apparent. In the left fundus there was a densely dark mass behind the lens, which completely blocked all the fundus reflex, except at the periphery beyond the edge of the black mass. The appearance strongly suggested a large organised blood clot.

Here again one had to deal with what appeared to be unaccountable intra-ocular haemorrhages. Retinitis proliferans seemed to be the most satisfactory diagnosis of the condition as I saw it; but it is quite possible that the clinical picture was due to some obscure inflammation and not to haemorrhage. Detailed view even of the right fundus was not easy. There was nothing in the

man's general condition to suggest the cause of his symptoms.

MENINGITIS

The following is an extremely curious and difficult case. It seemed probable that the blindness was due to an attack of meningitis, followed by thickening of the meninges and subsequent optic atrophy.

Case 61. The man was aged 24 years, and when he came to St. Dunstan's he had bare p.l. in both eyes. He gave a history of an extremely severe heatstroke when serving in Egypt, about three and a half years previously. He was in hospital for several weeks, and his sight was severely affected from the first. Eventually his vision improved so much that he was sent to France to guard prisoners. There his vision gradually began to fail again, and two years after the attack of heatstroke, he was invalided on account of progressive blindness. The man was myopic to the extent of $-7D$ in each eye, but lenses produced no improvement in his vision. There was nothing to note in either fundus, except that the discs were rather pale, especially the right. The retinal vessels were of fair calibre, and there was no sign of previous swelling of the discs. The media were quite clear and the tension normal. The visual fields could not be mapped, and were so contracted that there was no lid reflex on either side. Beyond the ocular symptoms there was no nerve abnormality of any kind. The patient complained of severe headache, but otherwise was in good health.

Two or three months after his admission to St. Dunstan's he became insane and had to be removed to an asylum. He was still living in 1921.

PITUITARY TUMOUR

The series contains notes of three cases of this interesting disease, all of which seem worthy of record.

Case 66. The patient was aged 27 years, and was completely blind in both eyes. The history was a curious one. He had a bad carriage accident ten years before, and apparently fractured the skull on the right side, because the accident was immediately followed by an operation, which was probably one of decompression. He made a good recovery, and was accepted for the

Army and graded A 1, though he said that his sight had never been quite perfect since the carriage accident. He went to the Front, and served for two years, at the end of which time his sight, which had been failing slowly for some time, had become so bad that he was discharged. Failure had been steadily progressive ever since, and when I saw him, twelve months after his discharge, he was quite blind. He was suffering from paroxysmal headache, and both discs were very pale, with normal vessels. The right disc margin was slightly blurred above, and the cup rather filled in. When he came to me, being quite blind, it was impossible to test his fields, but he told me that his sight had gradually been closing in, which made me suspect that possibly his was a case of bi-temporal hemiopia. On this account an X-ray skiagram was taken of the skull, which clearly showed the presence of a pituitary tumour. Two years after the above notes were made the man was in much the same condition, and was still enjoying fairly good health.

Case 82. This was a case occurring in a man aged 21 years. He was completely blind in the right eye, but retained p. l. in the left. He stated that the right vision had not been normal for some years. He served for about four months in France, and, whilst there, the vision in both eyes failed very much, and he was discharged about three years before I saw him. The history, therefore, indicated a very long period of defective sight, certainly one of at least five years' duration, and probably more. Examination showed advanced primary atrophy of both discs, but no other lesions. The retinal vessels were fairly good. There was no family history of blindness. He was suffering from very bad bouts of paroxysmal headache, and complained of fits of trembling and giddiness. Lately he had grown very stout. The fields could not be mapped, but a skiagram showed an enlarged pituitary fossa, with absorption of the anterior clinoid processes. Over two years have elapsed since this note was made, and the man is still enjoying fair health.

Case 95. This was a case of a man aged 30 years. His right vision was reduced to 6/36 and his left eye was quite blind. He was badly wounded on the Somme—in the left arm and lung, by a machine-gun bullet, and he lost a very great deal of blood. Since that time he had always been extremely pale. Whilst convalescing in hospital he noticed that his sight was failing, and that his field of vision was closing in on both sides, but especially so on the left. He was discharged from hospital about nine months before he came under my observation,

and in the meantime had been invalidated from the Army for progressive failure of vision. No diagnosis as to the cause of sight failure had been made. Under examination the discs were seen to be extremely pale, especially on the left side. The vessels were of normal size, but also extremely pale, as indeed was the whole fundus reflex, similar to what one is accustomed to note in cases of extreme anaemia. Examination of the blood showed a very great deficiency of haemoglobin and a greatly diminished count of red cells. The field, of course, could not be mapped on the left side, but on the right it was entirely abolished over the outer segment, but was fairly normal on the inner side, the centre remaining intact all round. I suspected a pituitary tumour, and a skiagram showed an enormous enlargement of the pituitary fossa. The patient was subject to much headache, and showed marked evidences of dyspituitarism, in loss of hair, a tendency to get fat, and general mental inertia, with attacks of extreme drowsiness at times. Operation was not deemed advisable, and he was treated with pituitrin with great benefit as regards his general symptoms.

It is over three years since this patient first came under my observation. At my last examination about a year ago the right vision was, if anything, a little better, and the field was certainly not more contracted. His general mental condition was, however, rather worse. He was more inert, and was taking less interest. When I last heard of him, quite recently, he was continuing to take pituitrin gr. 1 twice daily, and missed it if he omitted a dose.

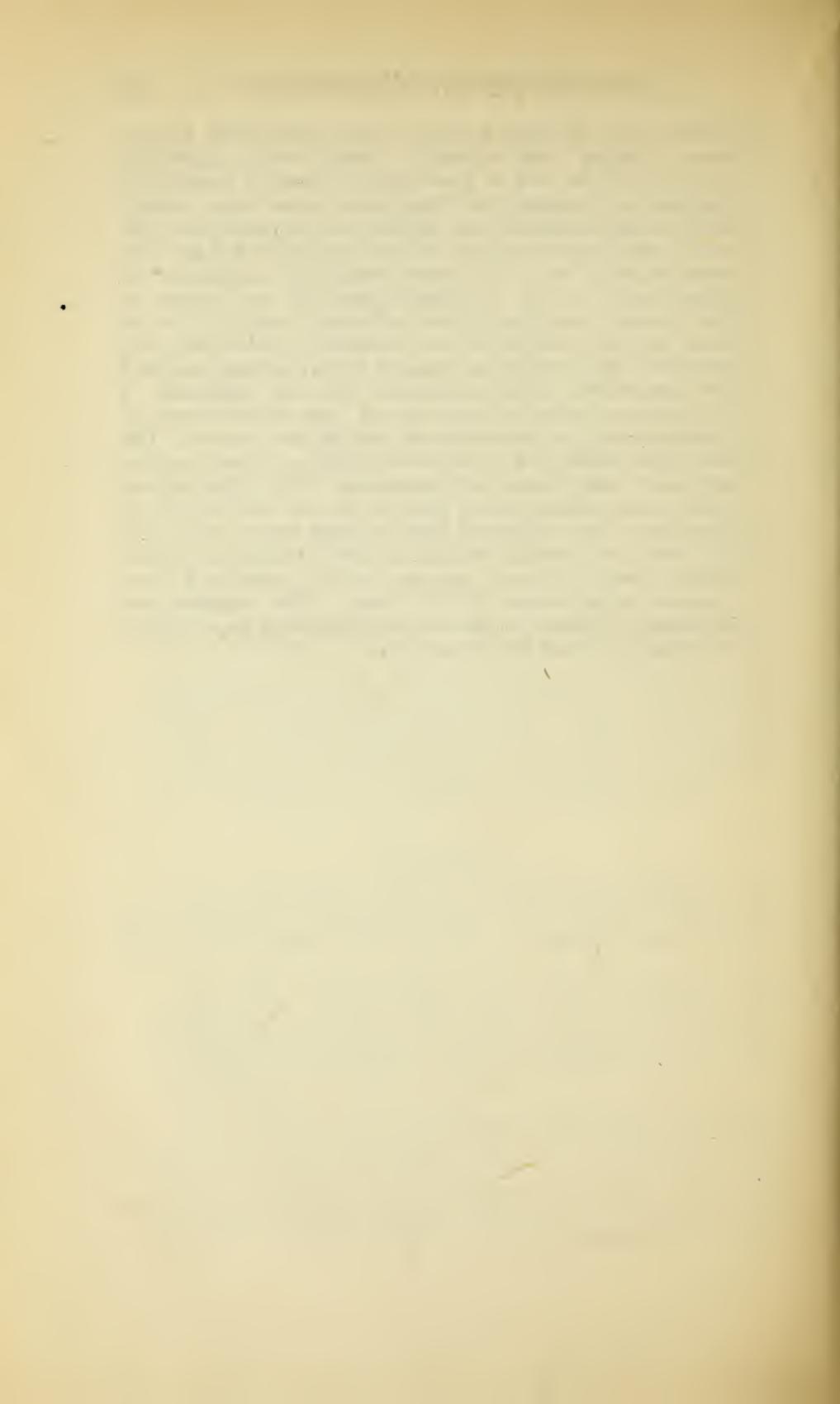
TRACHOMA

I will conclude the series by relating the history of an unusual case of blindness from this disease, which was cured by operation and treatment of the lids with radium.

The man was aged 24 years when he came under observation, and the right vision was somewhat less than 6/60, whilst the left vision was reduced to the counting of fingers at short range. He was accepted for the Army, and whilst on training his eyes were injured in a very unusual way.

His company were practising with blank cartridges, and he turned round just as the man behind him fired over his shoulder, with the result that he received some of the contents of the cartridge in his face. The eyes at once became extremely inflamed, and his sight was so bad six months later that he was discharged. He then

came to St. Dunstan's, and I found that both corneaæ were diffusely and severely affected with superficial pannus. There was a great deal of patchy interstitial haze of each cornea and both upper tarsi were covered with recent trachoma granulations, interspersed with old scars. He gave a history of having suffered from bad eyes when a boy. He was treated at hospital, and there seems to be no doubt that he was more or less cured, and that the affection was relit once more by the accident above described. Obviously the condition of the lids was missed when he was accepted for the Army. After admission into St. Dunstan's I took the patient into hospital, and treated both eyes by peritomy and cauterisation of the limbus corneaæ. The lids were treated by radium emanations. Great success attended both forms of treatment. The granulations were entirely destroyed by the radium and the lids cured. The right vision improved to 6/12, with Sph. -2D. The left was also cured, but the cornea retained a rather dense central corneal opacity, which prevented very marked improvement in his sight. The patient was therefore able once more to earn his living as a sighted man, and to leave St. Dunstan's.



PART III
PENSIONS AND RE-EDUCATION

CHAPTER IX

DISABILITY PENSIONS FOR THE BLINDED SOLDIER

THE Disability Pension for blindness is the same as that given for any other form of total disablement.

THE WAR HISTORY OF DISABILITY PENSIONS

Prior to and for rather more than two years after the outbreak of the Great War, the awarding of pensions to disabled soldiers was made on the recommendation of the Chelsea Commissioners, who were given statutory authority to undertake these duties in the year 1754. This body, acting in conjunction with the Army Council, carefully examined in detail each application for a pension made to them, and, when satisfied as to the eligibility of the claimant, issued instructions to another Department to arrange for the payment of a State grant. This method of working, although applicable at a time when there were comparatively few disabled men for whom provision had to be made, proved to be quite impracticable as the war progressed; for not only did it create a certain amount of suspicion amongst disabled soldiers, but it was responsible for untold delays. The discontent thus caused finally culminated in December 1916 in the formation of a Ministry of Pensions, which brought under the jurisdiction of one Department both the awarding and issuing of Disability Pensions.

At the beginning of the war, and for a long time afterwards, a disability pension was only granted to men who had been blinded as the result of their War Service. Men whose blindness was due to disease, and in whom no infection directly due to their service could be traced, were ineligible.

Up to the 28th February, 1915, the maximum compensation made to a soldier who had been totally blinded as the direct result of War Service was 2s. 6d. per day in the case

of a private, with a small increment, according to rank, for non-commissioned officers. The meagreness of this allowance was realised in the latter part of 1914, and after much public agitation a Cabinet Committee drew up a new scale of pensions. Parliament, however, considered these proposals to be inadequate, and in November 1914 a Select Committee was appointed to make further recommendations.

After some eighteen sittings, at which various Government officials were examined, the Committee issued its report, and the proposals embodied in it were adopted in a Royal Warrant issued on 21st May, 1915, to take effect from 1st March, 1915. This Warrant authorised the following weekly pensions to *totally* blinded men, whose disabilities were *directly* attributable to Active Service conditions :—

Wrvt. Offr.	Wrvt. Offr. Class 2, or				Privates, etc.
Wrvt. Offr.	N.C.O.	N.C.O.	N.C.O.	N.C.O.	Privates, etc.
Class 1.	Class 1.	Class 2.	Class 3.	Class 4.	
40s.	33s.	31s.	29s.	27s.	25s.

together with an additional allowance of 2s. 6d. per week for each child born before discharge, until the child attained the age of 16 years.

In the early part of 1916 the Government realised that provision had to be made for soldiers who had been discharged on account of disease, not wholly due to War Service, but *aggravated* by it, and on the 11th June, 1916, a Royal Warrant was promulgated to the effect that “a European soldier, discharged in consequence of the present war as unfit for further service on account of disease not directly and wholly due to War Service, but aggravated by it, may be granted a pension.”

The result of the addition of this *aggravation* clause, as it was speedily styled, was to admit many men to pensions who previously had been debarred. It reacted very strongly in favour of men who, in spite of defective sight, the result of disease, had been accepted deliberately for Army Service, and very frequently, too, it furnished an excuse for the claiming of pensions by men in whom the disease was not caused by wounds. As can be imagined, the question of defining the extent to which the term “*aggravation*” was applicable, was the cause of endless friction and heart-burning in a large number of cases, so

that, when the Pension work was taken over by the Ministry of Pensions at the latter end of 1916, an Appeal Board was established, whose work it was to adjudicate on these cases in which the aggravation clause was held not to apply, should they desire to appeal against the decision. This Appeal Board was composed of officers appointed by the Ministry, and its decisions were final.

The Appeal Board, however, was not a complete success, in that many men felt that they were unjustly treated when informed that they were ineligible for pensions. They were suspicious as to the impartiality of the Appeal Board, because it was composed of men in the service of the Ministry, and who might on this account be biased in their views. Thus, there still continued to be much dissatisfaction, and after a certain amount of delay the Ministry initiated a third and final tribunal, known as the *Pensions Appeal Tribunal*. The central idea of this tribunal was that it should form a complete impartial connecting-link between the men and the Ministry of Pensions. If a man after disallowance of pension was still refused when his case had been considered by the Appeal Board, he was able to refer his case to the decision of the Pensions Appeal Tribunal, whose verdict was accepted as final both by man and Ministry.

The Pensions Appeal Tribunal consisted of various courts, who sat at different centres of the country, each court being composed of an ex-army and ex-naval disabled man, together with a chairman, who was not a Government official, to give the casting vote. A medical practitioner was also in attendance, although he was not allowed to vote.

In the first instance the appointment to the Tribunal rested in the hands of the Ministry of Pensions, but subsequently (on 9th August, 1919), in order to make the Tribunal still more impartial, the authority to appoint to the Tribunal was vested in the Lord Chancellor, and the constitution of the court was somewhat altered, the final and present arrangement being :—

1. A local representative, being a barrister or solicitor, in either case of not less than seven years' standing.
2. A disabled officer who has retired, or has been demobilised during the war suffering impairment, or a disabled non-commissioned officer or private, who similarly has been discharged or demobilised.

Note.—It is customary when dealing with an officer's claim for the naval or military member to be an officer, whilst for claims dealing with non-commissioned officers and other ranks, an N.C.O. or private is selected.

3. A duly qualified medical practitioner.

Each member of the Tribunal has power to vote.

In order to help the Pensions Appeal Tribunal thoroughly to sift each case, Local Committees were appointed by the Ministry throughout the country, and they were empowered to collect the necessary evidence for submission to the Tribunal.

These Pensions Appeal Tribunals have worked well and equitably on the whole, and an enormous amount of time and labour has been given to them by many patriotic and self-sacrificing men, and my own experience, which is not a small one, is that every case is given a careful and impartial hearing. Certainly, so far as the blinded men are concerned, the benefit of any doubt is given, as it should be, in favour of the man, and I have often been impressed by the anxiety displayed by the court not to overlook a single point in support of the claimant's case.

Reverting to the actual amount of the Disability Pensions, the awards adopted by a Royal Warrant on the 21st May, 1915, and quoted above, remained in force until the formation of the Ministry of Pensions in December 1916. Very soon after this date, on the 29th March, 1917, a Royal Warrant was issued which made the following fresh increased allowances to blinded men, with effect from the 4th April, 1917.

Wr. Offr.	Wr. Offr. Class 2, or		N.C.O.	N.C.O.	N.C.O.	N.C.O.	Privates, etc.
Wr. Offr.	Class 1.	Class 1.	Class 2.	Class 3.	Class 4.	30s.	27s. 6d.
42s. 6d.	37s. 6d.	35s.	32s. 6d.	30s.	30s.	30s.	27s. 6d.

together with an additional allowance of 5s. for the first, 4s. 2d. for the second, 3s. 4d. for the third, and 2s. 6d. for each succeeding child.

Note.—Prior to the issuing of this Warrant, the allowance was only given to children who were born before discharge. The allowances were now, however, extended to children born within nine months after discharge.

The Royal Warrant, moreover, authorised :—

1. The issue of an allowance, not exceeding 20s. per week,

in any case where the *constant* attendance of a second person was necessary.

2. The issue of an *Alternative Pension* in cases where a pensioner could prove that the Flat-rate Pension, together with children's allowances, if any, were less than his pre-war earnings. In such a case, a pension, based on the average pre-war earnings, was awarded up to a maximum of £2 10s. per week, plus 50 per cent. of any pre-war earnings between £2 10s. and £5 per week.

3. The issue of an allowance during training in an Institution of :—

(a) To a *wife*, an amount equal to one-half of the man's pension.

(b) To a single man's *dependent*, an allowance based on the assessed degree of dependence up to a maximum of 10s. per week.

(c) To the *man*, his full pension, subject to a deduction in respect of his maintenance.

On the 1st May, 1918, children's allowances were increased to 6s. 8d. per week in the case of the first, 5s. in the case of the second, and 4s. 2d. for each succeeding child, and on the 1st November, 1918, a 20 per cent. bonus was added to all pensions, and to wives', children's, and dependents' allowances in view of the increased cost of living.

Prices, generally speaking, still continued their upward tendency, and the inadequacy of pensions was in 1918 again brought to the notice of Parliament. A Select Committee was thereupon formed to consider whether the existing pensions and allowances should be revised. This Committee, after many sittings, recommended that the following amended pensions should be issued, subject to revision in the event of the cost of living increasing or decreasing :—

Wr. Offr.	Wr. Offr.	Wr. Offr.	Wr. Offr.	Wr. Offr.	Wr. Offr.	Wr. Offr.
Class 2, or	Class 1.	Class 1.	Class 2.	Class 3.	Class 4.	Privates, etc.
	60s.	53s. 4d.	50s.	46s. 8d.	43s. 4d.	40s.

together with a weekly addition of 7s. 6d. for the first, and 6s. for each succeeding child, and an additional 10s. to a wife, provided marriage took place prior to the receipt of the wound for which the man was ultimately discharged.

It was also recommended that the scale of *Alternative Pensions* be amended, so as to permit the issue of the *whole* of a man's pre-war earnings, plus a bonus of 60 per cent. of his pre-war earnings up to a maximum of £5 per week. The maximum allowance issuable to a single man's dependent was also considered, and it was suggested that this should be increased to 14*s.* per week. The *Attendant allowance* remained unaltered.

Parliament authorised the granting of the amended rates to take effect from the 3rd September, 1919, subject to revision in the year 1923, should the Board of Trade Returns show an increase or decrease in the cost of living. A definite pledge was, however, given, that the scale of pensions in existence before the 3rd September, 1919, would not be decreased even if a considerable drop in prices had occurred.

The value of the *Alternative Pension* is not very obvious off-hand, and a few examples will serve to explain the matter, by which it will be seen that sometimes the one and sometimes the other has the better financial result for the pensioner.

Example 1.—The man, a private, earned 25*s.* before the War as an agricultural labourer, and is a single man.

Flat-rate Pension with an Attendant allowance, £2 10*s.* per week.

	£	s.	d.
Alternative Pension will be . . .	1	15	0
Plus 60 per cent. of 25 <i>s.</i> . . .		15	0
Total Pension . . .	2	10	0

In this case, therefore, the one rate is the same as the other.

Supposing the man has a wife and three children.

	£	s.	d.
Flat-rate Pension will be . . .	2	10	0
Plus wife 10 <i>s.</i> and children 19 <i>s.</i> 6 <i>d.</i> . . .	1	9	6
Total Pension . . .	3	19	6

and therefore Flat-rate will be better than the Alternative Pension.

Example 2.—The man earned £2 10s. per week before the war, and is single.

Flat-rate Pension will be as before, £2 10s.

	£	s.	d.
Alternative Pension will be	3	0	0
Plus £1 10s.	1	10	0
Total Pension	4	10	0

Here the Alternative Pension is again much better than the Flat-rate.

But supposing the man has a wife and five children.

	£	s.	d.
Then the Flat-rate will be	2	10	0
Plus £2 1s. 6d.	2	1	6
Total Pension	4	11	6

in which case the Flat-rate and Alternative Pensions are approximately similar again. If the man has only three children it will be seen that the Alternative rate is the better for him.

These examples show that the Alternative Pension is more advantageous than the Flat-rate scale, if the man's pre-war earnings amount to more than 25s. per week, and provided he is single. On the other hand, the Alternative Pension gives no extra allowance for wife and family, so that the man with a *large* family might be better off with the Flat-rate Pension.

In any case, it is permissible for a man to revert back from Alternative to Flat-rate Pension if his financial circumstances, such as increasing family, show that such reversion would be to his advantage.

Some further slight additions to these regulations were made by an Act of Parliament in 1921.

1. The first point was with reference to making a time limit for application for pension, and it was enacted that a claim for pension must be made within seven years after the date on which the claimant was discharged, or after the date of final termination of the war, whichever is the earlier.

2. The second had reference to making awards final, which up to the present time had been always revisable

every twelve months. It was enacted that, where possible, all awards should be made final not later than four years after the man's discharge from the Service, or after the first award of a pension to him.

3. It was further decided to set up a *special* Pensions Appeal Tribunal to which a man could refer if he thought the final award should not have been made, or that the proper amount had not been awarded. The time limit for appeal was fixed at one year from the date shown on the notice making the award.

PENSIONS WORK AT ST. DUNSTAN'S

As the War progressed the work in connection with the men's pensions became increasingly more and more onerous; for, being blind, the men could do nothing for themselves in filling up forms, or in doing other little things required by the regulations. Consequently, a special Pensions Department was initiated, supervised by a special Pensions Officer, whose duty it was to attend to everything in connection with the men's pensions. The amount of weekly work carried through by this Department by the time the war was over was enormous, and required a separate office and a large staff of clerks.

As soon as the Pensions Appeal Tribunals had been started, the late Sir Arthur Pearson, with his usual initiative, set to work on behalf of the men at St. Dunstan's. He realised that, however desirous the local committees, who were appointed to collect evidence for the Tribunal, might be of helping blinded soldiers and sailors, they would not be able to render such valuable assistance as would be the case if St. Dunstan's made itself personally responsible for the Appeals. He therefore approached the Ministry with a view to having St. Dunstan's nominated as a Local Committee for blinded soldiers and sailors. This proposal was favourably considered, and all questions relating to appeals in respect of men who had been unfortunate enough to be refused a pension, were thenceforward undertaken by the Pensions Department of the Hostel.

After the issuing of the Awards under the Royal Warrant of March, 1917, Sir Arthur Pearson also arranged with the Authorities that in a case where blindness was the only disability an Attendant allowance of 10s. per week should be issued to each man, increasing *pro rata* to the full amount of 20s. per week where further disabilities

existed, such as the loss of a limb, etc. He also refused to make the maintenance stoppage of a shilling a day from a man's pension whilst he was undergoing training at St. Dunstan's, although this procedure was adopted invariably by other institutions.

PENSIONS WORK FOR THE TRIBUNAL

It was not long after the initiation of St. Dunstan's that men began to come who had been blinded by disease, and who were ineligible for pensions according to the regulations then in force. As time wore on, the number of these pensionless men increased very considerably in spite of the addition of the "*aggravation*" clause, which did admit a certain number of men to pensions who had been refused before. Consequently, when in 1917 came the formation of the Pensions Appeal Tribunal, there was a large number of men anxious to avail themselves of a further chance to press their claims. In many such cases the men were absolutely penniless and entirely dependent on the help that St. Dunstan's could bring them for the support of themselves and their families. This was, of course, a tremendous burden on the finances of St. Dunstan's, and as the previous decision of the Appeal Boards appeared inequitable in the cases of a considerable number of these poor fellows, we prepared for a great campaign on their behalf.

St. Dunstan's having been nominated as a Local Committee for collecting evidence, a great deal of trouble was taken to work up the cases and to place accurate information before the Tribunal. The greatest care was necessary, because the men themselves, in their anxiety to present their cases in an advantageous light, were apt to exaggerate and sometimes were completely unreliable.

The claimant was, in the first instance, carefully questioned by the Pensions Officer in order to ascertain the exact conditions under which he had served. This information was then sent to me and compared with my own record of his history and his medical condition, both on entrance to St. Dunstan's and subsequent to it. If necessary, I interviewed the man on any conflicting point, and finally I drew up a detailed certificate embracing the whole period of the man's Army Service, and deducing therefrom all the points that would bear on the man's claim to a pension. By adopting these precautions the possibility

of misunderstandings and the inadvertent suppression of material facts were reduced to a minimum.

It was also desirable to obtain certificates from the man's pre-enlistment employer and doctor, in order to ascertain whether he was away from work at any time owing to illness, and the state of his health in general. These certificates, together with the report from his National Health Insurance Society, showed the man's condition before recruitment, and were most useful, as in many cases the medical examination at the time of enlistment was quite unreliable.

Owing to the kindness of the Ministry of Pensions and subsequently of the Lord Chancellor, the Appeal Tribunal for blinded men has for a long time past sat at St. Dunstan's, and at each hearing the Pensions Officer at St. Dunstan's is always present on behalf of the claimant. I also invariably attended to give any further supplementary medical evidence that the Tribunal might desire.

The results of our labours were, I think, very good, for at the time of my resignation in May 1920 we had presented the cases of 56 men who had been refused pensions by the Appeal Boards, and in 48 of them, or nearly 85 per cent., the claims put forward were successful. One would have been still better pleased if every blinded man had received his pension; but in the case of those that failed to secure a favourable verdict the Army Service had usually been very short and generally passed at home. It was not possible in their claims to substantiate the aggravation of their disease by military service, and that forced the Tribunal to disallow the Appeal. My personal view was, that it was in the interests of the State to part with the little extra sum needed to pension off these unfortunate men, whether they were strictly entitled to the boon or not. After all, they had lost their sight whilst serving their country, and it was not good that there should be blinded men distributed over the country able to say this, and to point the moral of a great nation's ingratitude. None the less, the number of successful claims shows how willing and anxious the Tribunal was to take the man's view and to make the utmost allowance for any points that could be made on his behalf. The Tribunal was bound hand and foot by the "aggravation" clause, and it had no power, however willing it might be, to grant a pension unless this clause could be brought to bear on the case.

DIFFICULTIES ARISING IN CONNECTION WITH PENSIONS
APPEALS

From the outset the Medical Boards were obsessed by the question of syphilis, the most prolific cause of non-traumatic blindness. They would not, or could not, realise that nerve syphilis leading to blindness was, as events proved, a common product of the war and due to it. Practically all cases of primary optic atrophy were thrown out when a claim for pension was made. The same attitude was adopted to cases of blindness due to interstitial keratitis and other varieties of destructive inflammation associated with syphilis. If the case reacted positively to the Wassermann test, that seemed to furnish sufficient grounds for disallowment of the claim. This attitude was the more unreasonable, because the question of syphilis was only raised in cases of total disability from the disease. A thousand men might have syphilis, and if any of them qualified for pensions on account of wounds, nothing would be said about the syphilis; but if an unfortunate was blinded by the disease before he got wounded, nothing could be done for him.

The question in time became a most urgent one, for, as already pointed out, there were a large number of these cases at St. Dunstan's, many of whom had a history of long war service and who were absolutely destitute. After a certain amount of discussion, I was asked to embody my views on the subject in the form of a memorandum, which I sent to the Pensions Appeal Tribunal, and at the same time a claim, which was a typical example of syphilitic nerve blindness, was prepared. A particularly difficult case was chosen, one that it was felt would be a good precedent for others of the same sort in the future, should the appeal for pension prove successful.

It was suggested that I should submit myself to cross-examination on the subject-matter of the memorandum and upon the special features of the case, which was to be heard at the same time, to which I readily acquiesced. Two members of the medical profession, one an eminent physician and another an equally eminent surgeon, were sitting on the Tribunal when the case came up for hearing, and the appeal was successful, by an unanimous vote.

For the sake of clearness a verbatim report of the memorandum is herewith appended.

" 12 Harley Street, London, W.1.
" 5th November, 1917.

" I HAVE been asked to place on record my views on the question of blindness associated with syphilis arising in soldiers and sailors during this war.

" The matter is an extremely important one and somewhat intricate. To be clear, I shall draft my views into a series of numbered paragraphs, and then briefly summarise the points I wish to bring forward.

" 1. It is urgent to recognise, in the first place, that there are two varieties of syphilis—(1) congenital, *i.e.* inherited; and (2) acquired. Both classes may equally lead to blindness.

" 2. The types of blindness in both are similar. Clinically it is generally possible to differentiate positively from collateral evidence between the two, and definitely to assign the origin as either inherited or acquired. On the other hand, it is not always possible to do so; and, as the Wassermann blood-test reacts equally in the one class as in the other, it may and does sometimes happen that a man is accused of contracting the disease which he has, in fact, inherited.

" 3. Syphilitic affections of the eyes leading to blindness are of two distinct kinds—(a) primarily inflammatory and causing blindness by the results of inflammation; and (b) primarily degenerative, *i.e.* unaccompanied by inflammation.

" The first (a) class occur in any stage of inherited syphilis from early childhood to middle life, and in recent or fairly recent acquired syphilis. The second (b) class may also occur in any stage of inherited syphilis, but hitherto have been regarded as rare in acquired syphilis until the disease has been of several years' standing.

" 4. The inflammatory class (a) are usually very amenable to treatment, and will not cause blindness if taken early and energetically treated, though the sight may be damaged. The degenerative (b) class, on the other hand, are extremely intractable, and nearly always progress in course of time to complete blindness.

" 5. The results of the war have been to show—

" (1) That a number of men have lost their sight from inflammatory syphilis.

" (2) That blindness due to degenerative affections (such as optic atrophy) forms a very large

class in soldiers, and not very infrequently occurs in mere lads in their 'teens' or early 'twenties.'

" 6. It is a well-recognised fact that the manifestations of any virus are very much influenced by the power of resistance, *i.e.* the vitality of the subject; whilst its determination to any one spot or organ may be decided by the special weakening of resisting power in that locality, often due to any prolonged strain or stress on that particular part.

" 7. In warfare, and probably in this war more than in any other previous campaign, the soldiers have been exposed to great hardships and strain, and syphilitic affections have the tendency to be extremely severe in their symptoms and damaging in their consequences.

" Probably the strain of war reacts more decisively on the nervous system than on any other part of the human mechanism. Of that there is abundant evidence in the numerous cases of shell-shock and shattered nerves. The eyes as 'the windows of the brain' and developed originally from the primitive brain, and further the chief means by which the nervous system is kept in touch with external affairs, are very prone to exhibit an extreme sensitiveness as one of the results of prolonged or severe nerve-strain. Of that, again, there is complete and full evidence. If the soldier is already weakened by syphilis the determination of the virus to the eyes is a contingency extremely likely to occur. The eyes are also especially exposed to adverse weather conditions such as cold and wet, and it is well known that in peace time syphilitic inflammation of the eyes often follows prolonged exposure to such influences.

"Summary

" To summarise the matter. The question of inherited or acquired syphilis ought to be very carefully sifted in every case, and especially as both varieties react 'positively' to the Wassermann blood-test. It is obviously grossly unfair to attach any importance to the question of syphilis if the complaint has been inherited. Then the number of soldiers blinded from the inflammatory syphilitic affections shows either (a) that the inflammatory attacks are of particular severity, or (b) that often they do not yield satisfactorily to treatment, or (c) a combination of both conditions. Further, the large percentage of blindness, due to degenerative affection

of the nervous structure of the eyes, is most striking, as is also the youth of many of the sufferers. All these points come out most strongly, and can be fairly and adequately explained by the conditions of the soldier's life on active service. They point absolutely to the conclusion that a large number of blind syphilitics owe their blindness indirectly to their service on behalf of their country, and that had it not been for such service very many now hopelessly blinded would be enjoying good sight. Finally, it must be remembered that syphilitic eye affections form in normal times merely a fraction of syphilitic manifestations, and no expert writing on syphilis would emphasise blindness as a danger more prominent than many others. Yet, as a result of this war, the number of blinded syphilitics is appalling, and it can only be explained in the manner I have tried to indicate. I feel most strongly that these points should be clearly set forth for the consideration of all Tribunals who have to deal with the future of these men, and I hope that they will modify in a large degree the very wrong but prevailing opinion that the country has no responsibility for their blindness.

“(Signed) ARNOLD LAWSON.”

Subsequently, when at the Tribunal I urged that too much weight should not be placed on a positive Wassermann reaction, in that it did not differentiate between a congenital and acquired syphilis, and, though valuable as a positive sign of syphilis in general, was of little value as a negative test, in that about 25 per cent. of cases of late syphilis did not react to it. Further, there were other diseases which might give a positive reaction, such as malaria, so that the test as a diagnosis of acquired syphilis should only be used with great care.

The successful issue of this appeal was extremely encouraging, and helped very much with other similar cases we brought later on for hearing.

In addition to the syphilitic cases there was another large group of blind men suffering from some form of congenital or infantile disease, whose sight was very defective when they were passed for the Army, and who subsequently had become blind. Many of these had been disqualified for pensions, and their cases were peculiarly hard ones.

It was quite clear that many of them should have been rejected as unfit for any military service, and when the obvious happened, and their sight was lost, it was adding

insult to injury to disclaim responsibility because the association between their service in the Army and the progress of their disease was not apparent off-hand. One would have thought that when a man had reached, say, to the age of twenty-five years, and could at that time earn his own living, but after serving in the Army for, say, twelve months had to be invalidated because of incapacitating blindness, that a very simple deduction as to the effect of his military service was obvious, even though the exact reason for the deterioration of sight was not.

But that was not all; for, if the State accepted the responsibility of taking a man with defective sight, the onus was surely on the State to disprove the association between the subsequent blindness and Army Service, and not for the man to prove it. Of course, if the recruiting medical officer had been sufficiently conversant with the subject of eye-disease the majority of these cases would have been rejected in the first instance; but the incapacity of the responsible officer in this respect should tell in favour of the man, and the least that could be done to repay this injustice was to alleviate his condition in the only way that was open, viz. by granting him a full disability pension.

These arguments generally clinched the matter in favour of the men. They were practically the crucial points in cases of retinitis pigmentosa, of which there were a good many examples at St. Dunstan's. Unfortunately, there were a certain number of men who did not come to St. Dunstan's until the latter end of the war, and after their final appeal had been heard elsewhere and refused. This was very hard on them, but of course it was not possible to reopen their cases again.

CHAPTER X

THE RE-EDUCATION OF THE BLINDED SOLDIER

THE problem of educating a child born blind and that of re-educating one blinded after the usual period of education has passed are two totally different matters. The former, broadly speaking, consists in finding some method by which the lack of one sense can be supplemented by extra training of the remaining senses. Thus a child who is born blind and has never seen a bird can be taught to appreciate the shape and characteristics of birds by the demonstration and handling of stuffed birds and models. All the intellectual faculties can be brought into play by side-route methods. Observation and concentration, the two most important desiderata of education, are developed by exercise of hearing, touch, and memory, whilst the expression of ideas by reading and writing after the blind methods is fairly easily acquired by the blind child of average ability when instructed by specially trained masters and mistresses.

For one who has already been educated on the lines of a sighted child, re-education after blinding is a problem of much greater difficulty, and previous to the recent war attempts to deal with it were inco-ordinated and unsatisfactory. A young adult blinded by accident or disease might ultimately learn to read Braille with facility—probably he did not. There were several most estimable societies devoted to the relief of such cases, but they, for the most part, worked by money grants and pensions, although others did excellent work in the maintenance of workshops, where the blinded could learn the trades of brush-, mat-, and basket-making. It was not always an easy matter to get admittance into these workshops, and if the patient did not feel inclined to go no moral pressure was applied. If the blinded boy or girl preferred to sit by the fire most of the day doing nothing, or to be led about the street playing a penny whistle or chanting some doleful ditty or hymn, or perhaps turning the handle

of a piano-organ, there were few to object or to make any special effort to turn him or her into a useful member of society.

The rapid influx of men blinded in the war from its very commencement brought the problem of the re-education of the blinded very keenly to the fore. St. Dunstan's Hostel, the biggest work of private enterprise that the world has ever seen, has shown what can be done and how it can and should be done.

DIFFICULTIES OF RE-EDUCATION

But before discussing methods of re-education let us see what are the special difficulties. In the first place the patients have already been educated through and by means of the eyes. Re-education means in fact commencing all over again on different lines at a period when maturity has been reached and the natural receptiveness and plasticity of the childish intellectual response to training are over. The child who is congenitally blind is much better off than the blinded adult. It cannot miss what it has never experienced, and all its faculties are trained easily enough to supplement what it lacks. In the case of the blinded man, the intellectual senses have been, to a very large extent, dominated by the eyes, and subservient to them. It is true that he has gained a very great deal by the experience won by means of his sight before it was lost; but the losing of it reacts against him in that he can no longer put his experience to the test of the eyes on which he was accustomed to rely. The blind child has never gained this experience of the eyes, but intuitively seeks to gain experience by other methods which come naturally to it, but which are totally unnatural to the sighted child.

That is the first great difficulty—the having to re-educate on totally new lines—and it becomes of increasing significance according to the patient's age, which is the second difficulty. For as we live and get older each one of us gradually becomes at first fixed in our methods of action and habits of thought, and then gradually less capable of absorbing fresh ideas, and less willing to try to absorb them. Thus we see that the re-education of a blinded person is only possible for a certain period of life. After that time has passed we must be content with an incomplete and increasingly inefficient result from our efforts.

As is said at St. Dunstan's, the man is trainable or untrainable, and the former class should theoretically, though, alas, not practically, embrace all cases blinded up to the age of 40. From the age of 40 to about 50 years there may be a certain amount of effective re-education, but the amount gained by the patient is not in proportion to the effort made, and after the age of 50, with the exception of a few who in the past have been highly intellectual, the re-education resolves itself in most cases to providing the patient with methods by which he may serve to pass the time pleasantly. The learning of Braille is a good instance of this, and it is found practically useless to instruct in this subject when the patient is over 40 years of age, though there are exceptions. The patient may master its technicalities at a much later age than 40, but it is rare to find one, who, commencing after this age, becomes sufficiently conversant with it to read Braille with real facility and with genuine pleasure.

The third difficulty is presented by the patient's individuality, which is a factor of enormous importance. It is very disappointing trying to re-educate a country bumpkin who has successfully resisted efforts to educate him when he had his sight. Such an one has passed the best educational time with his intellectual vision almost entirely subservient to the practical necessities of obtaining sufficient to eat and drink by unskilled labour. Only the simplest forms of re-education are applicable to such a man, although he may have attained manhood but a very short time, and even such simple training as may be applicable to his case may be extremely difficult to instil. On the other hand, a man who has received and proportionately absorbed the benefits of a good education in the past, may, under certain conditions, be capable, after he has been blinded, of resuming his usefulness as a citizen to as great or even to a greater extent than that to which he had attained before blindness overtook him. Of that fact we have had many notable examples in history, and in most recent times the names of Arthur Pearson and Towse will go down to posterity as examples of what a blinded man can achieve. However great these two men were in their sighted life, whatever power of achievement might have been theirs had they retained their sight, the fact remains that their great services to their fellow men followed on their blindness, and that what the world would have called their disablement has reacted to their glory.

Thus it is seen that the re-education of the blind man must be conducted on individual lines, varying with the person. It is not possible satisfactorily to educate every child, blind or not, on the same individual lines, though it is constantly being attempted and is the one great difficulty of school life; but it is even less possible in re-education, because the dominating individual characteristics of a grown man are infinitely more dominating than those of a child, and whereas it is possible to turn a child away from its natural inclinations, it is often not so possible in an adult.

The last great difficulty is one which is not constantly present, but which may prove a great stumbling-block. It is the mental attitude of resistance of some blinded persons towards attempts to re-educate them. It seems to exist temporarily in almost every case as a natural sequel to the first losing of the sight. The sudden plunging of the sighted man into darkness by the havoc of a shell-burst or bullet must be, and is, followed by a period of mental depression, often of a most acute character, which persists in many persons for a long period. The shorter this period can be made the happier for the patient, but so long as it lasts, the man is apt subconsciously to resist any effort to ameliorate his position. The younger the patient the more easily and quickly will he usually react to outside influences to help him, but in the case of people who are blinded in the evening of their lives it is not unusual to find a persistent passive attitude of inability to take interest or to attempt to make the best of circumstances. Of course, when a patient has gradually lost vision by the progress of some insidious disease, the ultimate catastrophe, delayed for perhaps several years, loses the greater part of its horror—the patient has had time to become acclimatised, as it were. It is the *sudden* or rapid loss of that upon which the beauty and enjoyment of life seem to hang, which causes the persistent melancholy from which so many old people fail to arouse themselves. Believe me, it is a far better thing to lose the sight in the spring or summertime of youth than in the autumn or winter of life. The natural sympathy of the world is for the blighted prospects of youth; all the might-have-been of life seemingly so utterly destroyed, the future so hopelessly dreary. After all, the elderly or old man has had his time of youth unblasted by blindness—not so many years of life still remain, and though blindness is

always hard he cannot win the same intensity of the world's sympathy as the young blinded man. And yet the world is wrong. For one of the great blessings of youth is its inability as a rule to look too far ahead. Foresight is largely a matter of experience won by age, and youth is always ready and usually capable of reclaiming and retying the threads of life which for a time have parted and separated him from most of what makes life lovely and pleasant. An old man generally cannot pick up the threads at all; or if he can find them he cannot tie them correctly—he is confined by his experience and his powers of outlook. He cannot start all over again—it is too late to do so even if he were to try. The old man is, in fact, as has been pointed out, untrainable.

It was this spirit of youth that was the chief asset in the production of that wonderful cheeriness which so pervaded St. Dunstan's during the war, and so astonished all who went there. The society of comrades similarly maimed helped in a very great measure; but neither the society of comrades nor the sympathy and help of all who worked at St. Dunstan's would have brought that laughter and that brightness, if St. Dunstan's had been peopled by old men instead of men mostly in the prime of youth.

CATEGORIES OF BLINDNESS

For the purposes of training, a man may be defined as blind when his sight is so bad that he is unable to earn an independent livelihood as a sighted man can do. Thus the blind can be divided into three categories or classes: (a) those who have completely lost their sight; (b) those who still retain fragments of vision but no useful sight, their powers being limited to bare light-perception or to some sense of form or movement over the whole or part of their visual fields; and (c) those who still possess some useful sight, vision that enables them to get about without aid and to recognise large objects close at hand, but insufficient to enable them to earn their living as sighted men. This latter class, as we shall see later on, embraces the most difficult cases for training purposes, because it generally happens that a patient cannot be taught to learn without using the weak sight that is still retained and which is thereby very frequently endangered by the instinctive straining set up. Class (a) is the most satisfactory of the three; for those who have completely lost their sight most

quickly become resigned and most easily are taught to do without it, and indeed fragmentary vision is of positive harm to many in that it gives no real comfort, but rather tends to confusion and to increase the difficulties. I have often heard patients say that they were worried by the retention of a little sight in one or two corners of the visual field, and similarly have heard others rejoice when they had lost it. It was well recognised at St. Dunstan's that the completely blind were the easiest to train, and our experience there was that these were the most contented of the patients, and that grumbling and discontent and other little troubles, generally present in any community, seemed chiefly to emanate from those who still retained a little sight.

PRELIMINARY RE-EDUCATION OF THE MORAL SENSE

Now before re-education in the sense of intellectual or manual instruction can satisfactorily be commenced there must be a re-education of the patient's moral sense. When sight is first lost the patient is plunged into an intellectual abyss from which there seems no way of escape. He finds, or rather fancies, himself completely dependent on others for everything. He cannot walk, eat, or amuse himself, and his every action seems to necessitate an appeal for help. He may at first try to be independent, but probably soon gives up such apparently futile efforts: he tends more and more to lose his sense of individuality and to rely entirely on the sympathetic help of those about him. The very first step in re-education consists in teaching the patient to recover his lost independence and to regard his difficulties not as disabling, but as inconveniences which can largely be discounted. That is one of the great secrets of the success of St. Dunstan's, for there the patient, removed from the environment of sympathising relatives and friends, only too willing to do all for the sufferer, whilst the sufferer gradually becomes entirely willing that all should be done for him, is brought into the midst of a large community where all are experiencing similar difficulties and learning to overcome them. The association of comrades in blindness, all of whom are there for the same purpose—viz. the overcoming of difficulties, combined with the companionship of teachers who help in the overcoming of them—soon begins to react on the patient, who finds out that all is not lost to him. With that feeling

of reaction comes the desire to try to do what he can to help himself, and as soon as that advance is made the progress will be rapid. Without doubt the experience of the last few years has shown conclusively that colleges or communities for the blind are the first essentials in re-education. It is not possible satisfactorily to train the blind by private instruction or by directly depositing them in workshops. Prior to everything else must come the learning of independence.

INITIAL TRAINING AT THE HOSTEL

The patient having arrived and settled down at the Hostel soon finds that while all are ready to help him it will be greatly to his advantage to help himself, and practical aids to do so are the next essential preliminary. Thus to enable him to find his way about the building, narrow strips of carpet, the edges of which can be detected by the stick with which each blind man is provided, are laid along rooms and corridors; and handrails, where necessary, afford further help, whilst stairs are indicated by patches of rubber or wood which the feet instantly detect. With these aids the man rapidly acquires confidence in walking alone in places and buildings which he has learnt to know, and will soon progress with almost the same ease and confidence as the sighted man.

Feeding neatly has also to be learnt, and the patient will with some practice attain a proficient use of knife and fork when he finds out that this is expected of him, and that he is not allowed to be spoon-fed like a baby, a habit that the blind rapidly acquire if left to themselves. Of course a certain amount of aid at meals is essential, such as the removal of bones of fish and so forth, but nothing is worse for the patient, and so contrary to the spirit of independence, than hand-feeding by another person.

Then, again, the patient must regain interest in his personal appearance—the neatness and cleanliness of his dress and person. Both these qualities have to be guarded by outside aid; the blind, if left to themselves, very speedily become indifferent to these points and slovenly in their habits. Shaving is easily taught and the patient quickly learns also to interest himself in the appearance of his clothes, his finger-nails, and the neatness of his general turn-out, especially when he is one of a community where these points receive attention and excite comment.

SOCIAL INTERCOURSE AND PHYSICAL TRAINING

The social intercourse, which is one of the great advantages of a community, will soon react on the man's attitude to outside affairs. He will begin to be less engrossed by his own misfortunes and to take more interest in what is going on around him. He will come in contact with others more advanced in re-education, whose experiences will prove of interest, whilst the knowledge of their difficulties similar to his own, and overcome, will stir in him the spirit of emulation to succeed himself. The old contemptuous proverb about "the blind helping the blind" is one that should be cut out of the wise sayings; for in very truth we know that the blind can and do help the blind, and that nothing is more helpful to the recently blinded man than the experiences of one who has gone through the mill himself and gained the victory. This was one of the special good works of Captain Towse in the war, and often have I heard of the comfort he brought to the bedsides of those who were sunk to the lowest depths of despair by the loss of all that seemed to make life worth living.

The advantages of social life are further exemplified by the relaxations, distractions, and amusements which are possible in a college for the blind. The greatest importance was attached to this side of re-education at St. Dunstan's, and rightly so. Firstly, it is difficult for a blind man, especially if he is young, to obtain the physical exercise necessary to good health, unless he is specially taught; and, further, such exercise not only interests and amuses, but it educates as well; for it teaches the blind that many of the pleasures which seemed lost can be regained, and this knowledge has its moral value in bringing out the spirit of independence and in awakening and stimulating the desire to compete once more in the life of the world around.

St. Dunstan's spared no pains to provide the men with all kinds of relaxation and amusement, and it was marvellously interesting to see how soon and with what keenness the inmates interested themselves. Perhaps the most popular of all the amusements was dancing. This was regularly taught and eagerly learned, and it was wonderful to watch the ability displayed by many of the men who were encouraged to compete for prizes given for grace and skill. Singing was another favourite amusement for those who possessed the necessary vocal ability, whilst,

similarly, instrumental music found many adherents, and this progressed to the forming of a band of blind musicians. But besides indoor distractions, outdoor sports were in great request, and none more so than rowing and sculling, which furnished splendid exercise, whilst rowing-races were eagerly anticipated and keenly contested. These are but examples of the kind of sport and amusement that all the healthy blind can do and do well. There are others, and perhaps some of them would seem utterly impossible. Thus I know of an excellent golfer who stuck to his game even after he had become completely blind. He found that after practice he could, aided by directions from a good caddie, continue to drive a straight ball and pitch fairly accurately to the green, and when there he would measure the distance from ball to hole and test the green by walking from one to the other, then proceeding to putt guided by the sound made by the caddie striking the tin with an iron club.

INTELLECTUAL AND ECONOMIC ASPECTS OF TRAINING

Thus it is evident that a short time spent at a place like St. Dunstan's should, and generally does, succeed in revolutionising the outlook of one recently blinded, and speedily prepares him for the more serious part of the training.

The actual training must be considered from two points of view: (a) that designed to cultivate the intellectual qualities of the blinded man, and (b) that intended to provide him with a means of livelihood. The first chiefly comprises the learning to read Braille and writing by means of the typewriter. Possibly the optophone will eventually supplement Braille, but at present this instrument does not seriously compete with it. It is too expensive for the ordinary person and its difficulties are very great, even to one who is gifted with a musical ear. Braille, too, is disappointing in a very large number of cases. As an intellectual exercise it is excellent, but to read it with sufficient facility much practice and continued exercise of that practice is necessary. The learning of the very numerous contractions is essential, and, even when mastered, proficiency is only retained by constant exercise to prevent the memory from slipping. Thus those who are blinded at a comparatively late stage of life—*i. e.* after 40 years of age—can rarely acquire the art, and further,

the young blinded man of the labouring class, whose education has been completed at the age of 14 years, and who has thereafter spent life in manual labour, has rarely either the intellectual ability required or the necessary delicacy of touch in fingers hardened and blunted by physical toil. Thus it comes about that whilst it is always desirable to include Braille learning as an essential factor in training, the final results of teaching are often disappointing, the pupil very frequently abandoning it when once set free to start life again in the world.

One interesting point about Braille is that it seems to appeal very little to those whom one would imagine, at first hand, had most need for it. I mean that those who are busily employed in intellectual work—work requiring great mental concentration—do not seem to use Braille much. It takes too much thought, and the man tired from brain work all day cannot, as a rule, be bothered with it at night as a means of relaxation. Typewriting, on the other hand, has not any serious drawbacks of this kind, and the blinded person of average intellect speedily acquires great proficiency. It is an exercise which seems to appeal to every blinded person, and the desire to become expert is stimulated at St. Dunstan's by the present of a typewriter to each man who succeeds in passing what is a very searching test examination of his powers.

Then as to training the blinded with a view to earning a livelihood. Before the war, workshops, in which the blind of the labouring classes were taught mat-, brush-, and basket-making, did a great deal of useful work, not only in teaching trades, but in furnishing a market for the wares. There was also a struggling society to train the blind of a higher social standing in the art of massage, which is eminently suitable for the blind; but the useful work of this society was much hampered by want of funds. For the comparatively small number of blinded members of the middle and upper classes there was really nothing open, and the teaching of Braille was practically the only effort made on their behalf. The advent of war stranded a number of blinded officers and educated men, and it became as important to provide a sustaining interest in life and often a means of livelihood for these sufferers as for the more numerous patients of lower social rank. A revision of the whole question of occupations suitable for the blind was necessary, and not one of the very many wonderful gains in knowledge and experience acquired

by the war has been greater than the vista of what can be done in the way of training the blind. The question now is not what the blind may be taught, but rather what they cannot be taught; for there seem to be but few heights to which a blinded man, under suitable environment, may not rise, provided he is gifted with the necessary grit and determination to make good. The late Sir Arthur Pearson, himself a man blinded at middle age, endowed with great intellectual capacity and marvellous powers of organisation, achieved nothing greater than the realisation in himself that it was still possible for him to carry on after his loss as well and in some ways better than he had done before. His blindness led him to search his powers, and finding out that he was, as he himself expressed it, "not disabled, but only inconvenienced," he opened a home for blinded officers, and living with them himself, he imbued them with the same spirit as himself and tried to show them that it was possible for each to make good in some way.

His efforts were crowned with marvellous success in a large number of cases, and I cannot do better than quote a few examples to show what I mean. One blinded officer, who had been manager in a large industrial concern, was taken back on trial by his firm and successfully proved his capacity to carry on his former duties. This gentleman was later sent to Australia to open and organise a fresh branch of the business, and has now returned after a completely successful trip. Two other officers, also totally blinded, started in company with a third sighted partner as insurance agents, and are doing very well. Another officer has resumed work as a barrister, whilst another endowed with an excellent voice was trained as a professional singer. Many others who had no special gifts were taught poultry-farming, whilst others, again, learned massage, and passed successfully the same examinations for diplomas as sighted candidates. It must be confessed, however, that the training of blinded officers was in some respects more difficult than that of the men. During the war commissions were given to all grades of society, and as a result of their disablement a certain number of blinded officers found themselves in possession of an income considerably larger than they had ever had before. In other words, there was a lack of incentive in some cases, due to the feeling that work was not necessary. Others, again, had ample private means before disablement, and this, again, but from

a different point of view, tended in a few instances to counteract the desire to make good.

Reverting again to the training of the majority—those who belong to the humbler walks in life—the selection of a suitable livelihood for each requires considerable care. For those who have spent their previous life in manual labour the old trades of brush-, mat-, and basket-making cannot be improved upon, for they are easily acquired, and to these may be added boot-repairing or “snobbing,” as it is termed, the latter proving a great favourite at St. Dunstan’s. Carpentry and even joinery, which at first sight seems almost impossible for a blind man, are also taught at St. Dunstan’s, and I have seen some wonderful work done by men who had never learnt anything about joinery until they had been blinded. A wise provision at St. Dunstan’s is the teaching of two trades of the simpler kinds. Thus the boot-repairer would also learn how to make mats or baskets or vice versa. The employment of blind instructors is a sound practice, because no one understands the particular difficulties of the blind pupil so well as one who has himself experienced them, and thus a certain number of pupils who can attain sufficient proficiency and possess the other qualifications necessary for teaching may obtain a good living in the future by becoming instructors themselves.

I have already alluded to massage and poultry-farming. The former is obviously only open to those who possess some social qualifications and refinement, and moreover, on account of the delicacy of touch required, is unsuited to those who have spent many years at manual toil. Further, there are stiff examinations to pass, and on this account those who have only the usual board school education behind them are unlikely to prove good pupils. The massage class at St. Dunstan’s may be said to comprise the pick of the men from the point of view of refinement and education, and the success that has attended the classes has been extraordinary. For some time past there has been an Association of Certificated Blind Masseurs, and all recent reports show what an unqualified success the exploitation of massage for the blind has been, and no doubt will always continue to be. Poultry-farming is another original and most successful experiment. At the outset this was personally superintended and taught by Captain Webber, himself totally blind for many years. Captain Webber discovered this as an amusement, and by

practice attained a quite uncanny power of dealing with poultry, at which a sighted man could only marvel. In the poultry class the men are practically taught by lectures and demonstrations everything that appertains to a poultry-farm. A farm was run in the grounds of St. Dunstan's, and here the men learned to handle and appreciate the different kinds of fowls, to prepare them for table, the secrets of successful breeding and prolific egg-production, and in fact everything that a sighted man might know on the subject. The success of the teaching has been abundantly proved by the number of blind men who are to-day successfully putting their teaching to the practical test of running their own farms.

Then, again, for those gifted with a musical ear, piano-forte tuning has for long been recognised as a suitable calling, but the field of employment is rather limited. Telephony has been a successful experiment for some of the better educated, and expert telephonists have been turned out. I had myself always hoped that cigar and cigarette making would come to be numbered amongst suitable employments, and lately this trade has been most successfully added to the list. I have no doubt as time goes on fresh fields of work will open out, for the interest of the nation has finally been aroused, as is shown by the formation of a Government Department devoted to the welfare of the blind. It is, indeed, as much to the good of the community at large as to the blind themselves that the latter should become good independent citizens.

DIFFICULTIES EXTRANEous TO LOSS OF SIGHT

The training of the blind presents certain difficulties beyond those directly connected with loss of sight. Thus, owing to the more intense concentration of mind required, the hours of work must necessarily be very limited, especially at first. Later on, as the work becomes more automatic, the blind person can gradually extend the hours of continued labour, but if the work involves great mental exercise it is bound to tire and strain much more than would be the case in a sighted person. At St. Dunstan's, where, of course, a great many men had experienced severe head and face injuries, the inability to concentrate for more than a very limited period was apparent, and the work-time was confined to two hours in the morning and two hours in the afternoon, and even this proved too long for many

of the patients. And as the hours of work must be shorter than normal, so the necessity of filling in spare time becomes of great importance. I have already dwelt at some length on the necessity and usefulness of these relaxations, and need say nothing further beyond that all St. Dunstan's people are taught string-bag making and netting, employments which need but little mental concentration, and afford interest, amusement, and, if need be, some profit. Reading aloud is another great pleasure to many blind people, and good readers will always obtain an appreciative audience. Cards marked with Braille notation enable those fond of this amusement to learn card games quickly, and I have seen more than one good bridge player among the blinded.

The turning out of an expert blind workman must, therefore, be a comparatively long affair. The average stay of a man at St. Dunstan's is about a year; but very many of the wounded took a much longer time than that, and many had to spend long periods of rest at one of the convalescent homes attached to the Hostel.

SPECIAL DIFFICULTIES OF THE BLIND CRAFTSMAN

When training has been completed the blinded man has to be launched out into the world to earn his living. Very little difficulty has been experienced with regard to those who have been re-educated in special work, such as massage, telephony, etc. These men are able to compete in the world's market on fairly equal terms with the sighted man, especially when there is a substantial pension in the background to help matters along. But in the case of those trained in handicrafts, as most of the St. Dunstan's men have been, the situation is different, and bristling with difficulties. The blind handicraftsman cannot possibly compete on equal terms with the sighted. He cannot work so quickly, or continue to do so for such long hours. His work is apt to deteriorate in quality unless periodically supervised. Little mistakes creep into his work and pass unrecognised, so that the occasional fault is apt to become habitual unless there is someone to overlook the work and put matters right again. The purchase of raw material in the best and cheapest market and the disposal of manufactured goods to the best advantage require help. For these reasons the blinded handicraftsman on leaving

St. Dunstan's is handed over to the great After-Care Department, which has done and is doing as much for the blinded of the war as the Hostel itself. This department was, at the start, most ably controlled by a brilliant young officer, Captain Ian Fraser, who, blinded early in the war, was specially selected and trained for the work. So well has he done, that, following on the recent death of Sir Arthur Pearson, he was promoted to be the Chairman of the Hostel.

AFTER-CARE

Thinking over the matter, one would naturally say that the most simple way of surmounting the difficulties of the case would be to draft the handicraftsmen into communal workshops dotted over the country at large commercial centres such as London, Liverpool, Manchester, and Birmingham. Without doubt the principle of this arrangement would be ideal, but practically such a course was neither possible nor altogether desirable for blinded soldiers. The expense of starting and maintaining such workshops would have been prodigious. The existing blind workshop accommodation was and still is woefully inadequate for blind civilians, let alone blinded soldiers and sailors, and I believe I am correct in saying that at the present moment room can be found for only about one-third of the blinded civilians. Then, again, supposing the possibility of such workshop accommodation, it is doubtful if the blinded soldier, with his pension of £2 10s. per week, would work in harmony with the blind civilian whose work has specially to be subsidised to give him a living wage. It would not be fair to pay one hand a lower price for a given article than another, and on the one hand, the civilian, unless he received special treatment in this respect, would be in a difficult position, and would resent the soldier with his pension being subsidised on equal terms; whilst on the other hand, the soldier in spite of his pension would probably refuse to work when he was paid at a lower rate than others engaged on the same job. Thus, the formation of large workshops for blinded soldiers and sailors being impracticable, it was decided to deal with the matter by settling the men in various localities where they produced their work at home. This arrangement necessitated (a) the formation of a large central dépôt, which is situated in London, and (b) the division

of the United Kingdom into districts, each under the care of a specially trained and paid inspector. At the central dépôt all the business of the after-care department is handled. Raw material is bought and stocked, and manufactured goods are stored for disposal. It is also the headquarters for the financial side, and the general reference centre for all correspondence, and all work connected with the welfare of the men. The local inspectors have much to do. Each man, when trained, is settled in his native district or as near as possible to any locality that he may choose, and it is the business of the inspector of his district to see to his being comfortably and suitably housed. Once there, he is visited at least once in every six weeks by his inspector, who supervises his work and points out mistakes if necessary. The inspector is also responsible for the supply of material and for the sending of his goods to be disposed of by the central dépôt.

The work is not directly subsidised, and quite rightly so, for with his pension the trained man can earn a very good living; but indirectly a very great deal is done to help each man. The material is supplied at actual cost price, and all expense connected with handling and storing material is charged to the department and is a direct financial loss to it. Thus, the more a man works the more he costs the after-care department, and so, indirectly, the man who works most gets most. Then, as regards sale of work, the man is paid by return of post at the highest market rate obtainable at the moment, and no charge is made for the carriage of his goods to London and for the storing of them. Very often the actual disposal of the goods is much delayed by over-stocking, and in the meantime the price may depreciate, so that the department again stands to lose, sometimes very considerably.

In times of sickness, accidents, or business difficulties the department is ready to help. Special care is taken that the patient is well looked after, and, if necessary, money grants are made to help in tiding over times of trouble. When convalescent the patient is sent free of all expense to himself to one of four Convalescent Homes attached to St. Dunstan's. These are situated at Hastings, Brighton, Cheltenham, and North Berwick, and the Home is prepared to keep him as long as necessary. These Homes are also used to provide annual holidays, and every man is entitled to a fortnight's rest yearly at one or other of them.

Thus it is obvious that the work of the after-care department is very great and very expensive. It is reckoned that each man, when trained, costs the department about £17 per annum. Of this sum about £12 is expended indirectly in subsidising his work, whilst the remaining £5 represents the average cost from possible sickness, accidents, business difficulties, and holidays. At the present moment there are about 1200 handicraftsmen thus settled, costing the department roughly about £20,000 per annum. Unfortunately there remain about another 300 men to settle, so that the department has to face a considerable increase in expenditure for some time to come.

It must not be thought that the department only looks after the handicraftsmen. It is ready to provide help for all those in special lines of work when required, and especially is its help needed with regard to sickness and holidays, but, as already pointed out, those in special work often earn very good wages indeed, and for the most part need no help except in cases of emergency.

THE UNTRAINABLE BLIND

Mention must be made, too, of the great class of untrainable blind, those who on account of age, infirmities, mutilation, or some consecutive disease, such as tabes, cannot be trained to earn an independent livelihood. Men of this class need a modified course of re-education. For some a light occupation, such as brush-making or chopping sticks for firewood, may still be possible, whilst string-bag making and netting, for them as for others, may help to pass away many weary hours. The Moon system of reading, which is very much simpler than Braille, may be taught to those who are too old to learn the latter, but the amount of available literature is limited, and reading Moon is a slow business and apt to become very tedious.

Quite a number of elderly men past 50 years of age who volunteered for labour work during the war were blinded as the result of their unselfish patriotism, and for a certain number of these, together with some who were mutilated in other ways besides being blinded, a permanent and beautiful home has been founded at Cheltenham. Here they are maintained in comfort, and everything possible is done to mitigate their lot.

THE PROBLEM OF MARRIAGE

There is one more point of real importance and much difficulty, and that is the marriage of the blind. Every young blinded adult of the male sex very badly needs a partner who can look after him and supervise the numberless details of life, such as dress, appearance, food and cooking, etc., who, in fact, can make a home for him. And yet to marry a blind man is a very serious step for any girl to take. She probably has it in her power to make him happy or utterly miserable, and to attain the former she must be content absolutely to give up her life to him. There is no middle way, and, therefore, though marriage is highly desirable, the girl must be of the right sort, and the problem is to find her. Many marriages with blind men have taken place during the war, and though some no doubt are proving idyllic, yet I know of others much the reverse, and then the state of the blind partner, or perhaps of the sighted partner, is indeed desperate. For blinded girls the situation is rather different. As a rule there is not the same necessity for them to earn their living independently, and they can generally find a home and shelter.

For the young of both sexes who are unmarried, communal settlements run on the lines of clubs are the ideal thing, if there are no parents or relatives to provide a home. To dwell in dreadful isolation in lodgings is indeed a doom to inspire despair, and I hope that in the near future some attempt will be made to start Blind Clubs to shelter these unfortunates.

THE THIRD CLASS OF UNFORTUNATES

And, lastly, just a word with regard to the third class of cases of which I made mention—viz. those who still possess some useful sight, but insufficient to enable them to earn their own living. A certain number of these cases are in some ways more unfortunate than those who are completely blinded. Many are the cases to whom I have had to refuse admission to St. Dunstan's simply because training would mean total loss of what they still had left. A person who can see cannot be taught to work without using his eyes. It is of no use to tell such a person not to look at the work or to bandage the eyes so that

he cannot see. If the eyes are not bandaged they will inevitably be called into play upon every little difficulty—*i. e.* at just the very time when sight is most needed and when it will be especially strained. Bandaging the eyes makes matters rather worse, for the necessary mental concentration will of necessity produce the reflex physical concentration of the eye behind the bandage, and the ultimate result in a very short time is a headache and aching eyes. Then there are others of the same class who can learn a trade without any special harm to the sight, but whose sight gets quickly exhausted, so that it is impossible for the person to work sufficiently long hours to earn a living wage. One really does not know what is the solution for these cases. St. Dunstan's has in many of them come forward with pensions which provide a sufficiency with external help from other sources, such as friends, or the money that a wife may earn; and, so far as I can see, State pensions are, in the future, the only way by which many persons of this class can be kept from pauperism.

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